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# **DRAFT Environmental Impact Statement for the Peabody Powder River Mining, LLC - Mackey Road Relocation**

**Douglas Ranger District,**

**Medicine Bow-Routt National Forests and Thunder Basin National Grassland**

**Campbell County, Wyoming**

**6<sup>th</sup> Principal Meridian**

**Township 42 North, Range 69 West, Sections 6, 7, 8, 17, 21, 28, and 33; and  
Township 43 North, Range 69 West, Sections 29, 30, and 31**

Responsible Official: Phil Cruz-Forest Supervisor

For Further Information Contact: Amy Ormseth, P.E.

Minerals & Lands Program Manager

Douglas Ranger District

Medicine Bow/Routt NFs & Thunder Basin NG

2250 E. Richards St.

Douglas, WY 82633

(307) 358-4690 (phone)

(307) 358-7107 (FAX)

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## EXECUTIVE SUMMARY

The U.S. Forest Service (USFS) proposes to authorize Peabody Powder River Mining, LLC (PPRM) to relocate portions of the Mackey County Road (CR 69) and Temporary Reno Road on National Forest System (NFS) lands. After construction is complete, the USFS proposes to authorize an easement to Campbell County for use and maintenance of the new route as a county road. The new county road segment will maintain public access to private, state, and NFS lands east of projected mine activities.

The proposal includes construction and reconstruction of approximately 8.7 miles of county road constituting a new route for the Mackey Road. These activities will affect approximately 7.1 miles on NFS lands in Township 42 North, Range 69 West, Sections 6, 7, 8, 17, 21, 28, and 33; and Township 43 North, Range 69 West, Sections 29-31. Approximately 5.85 miles of those affected NFS lands will entail new road construction; the remaining 1.25 miles will involve reconstruction of the existing NFS Road #968 - School Creek Road. Once the project is complete, a 100-foot wide (50 feet either side of center) right-of-way easement will be processed to Campbell County. The total impacted acreage on NFS lands associated with this project is projected to be approximately 292.7 short-term acres (i.e., during construction) and 85.7 long-term acres (new infrastructure and post-construction maintenance within the easement to be transferred to the county). The design specifications for the new road will conform to current county road standards. Campbell County will maintain the road after the easement is complete.

Upon completion of the new road, approximately 6.1 miles of the existing Mackey Road within the North Antelope Rochelle Mine (NARM) State of Wyoming, Permit to Mine #569 boundary will be vacated. Approximately 2.2 miles of the Temporary Reno Road (8.3 total miles) also will be vacated where it overlaps the current NARM coal lease and/or permit area. Most vacated road segments will be mined through and subsequently reclaimed in accordance with conditions specified in NARM's state mining permit.

All disturbance associated with the project on NFS lands will occur within a 300-foot to 700-foot wide corridor on NFS lands; approximately 0.5 mile of the project will involve major cut/fill construction. Access to the construction area will be from existing roads and two-tracks or from within the new corridor as it is built. Surface disturbance within these corridors will include: overland travel of vehicles and equipment; topsoil removal, stockpiling, and replacement; cut/fill activities; road base placement and compaction; gravel surfacing; fencing; and reclamation of ancillary areas. Dust control practices (application of water) will be used during construction to minimize dust emissions. Slope erosion will be controlled by the use of slope angle reduction, re-application of topsoil, re-vegetation, and, possibly, the use of mechanical runoff control features such as contour ditches, drop structures, etc. Standard reclamation techniques will be used to reclaim disturbed areas outside the final road easement. Engineered drainage structures consisting of multiple corrugated metal pipe or concrete box culverts will be installed to maintain post-construction habitat connectivity and prevent down-cutting and head-cutting where the road will cross Little Thunder Creek and School Creek.

## Purpose and Need

The USFS has identified a *need* for authorizing PPRM to conduct the activities associated with the relocation of a segment of Campbell County's Mackey Road and the Temporary Reno Road to allow NARM to fully develop existing federal coal leases WYW-179011, WYW-0321779, WYW-172413, WYW-172414, and WYW-151134, subject to the Mineral Leasing Act. The existing condition is that portions of these two roads overlie mineable coal within NARM's existing federal coal lease boundary. Full development of the federal coal leasing obligation will require that coal lying beneath those road segments be mined. The desired condition is to mine the coal beneath the roads, yet maintain public travel services provided by the roads. The *purpose* of this action is to relocate those segments of the Mackey and Temporary Reno roads outside the area to be mined in advance of mining and turn the relocated route over to Campbell County jurisdiction so that the underlying coal can be mined and public road services remain uninterrupted.

The project is in the administrative boundary of the Thunder Basin National Grassland, Douglas Ranger District, approximately 16.5 miles southeast of Wright, Campbell County, Wyoming.

The terrain in the project area and immediately surrounding lands consists primarily of gently rolling, open grasslands with more limited areas of sagebrush. More rugged scoria outcrops creating steeper terrain and a few small stands of ponderosa pine (*Pinus ponderosa*) also are present. All drainages are semi-perennial (due to perennial springs), intermittent, or ephemeral.

The majority of the project is located in the Highlight Bill Geographic Area. Minerals exploration and development and livestock grazing will be significant management activities in this geographic area. In some areas, restrictions on public use may be applied to ensure public safety and to avoid unreasonable interference with mineral operations. In those areas where mining is emphasized, reclamation activities will restore the area to a reasonable level of its pre-mining condition. Approximately 1.6 non-contiguous miles of the construction corridor will cross NFS lands in the Broken Hills Geographic Area; specifically, the General Forest and Rangelands: Range Vegetation Emphasis (5.12) Management Area. This area is managed primarily for the sustainability of physical, biological, and scenic values associated with woody vegetation and open grassland. Management emphasis targets a balance of resource uses and opportunities, such as livestock grazing, wildlife habitat, dispersed recreation, minerals management, and timber harvest, among others.

Scenery Management System objectives for the majority of the project area are to design and implement management activities, facilities, and landscape modifications to be visible but reasonably mitigated to blend with the natural features and landscape. However, the primary scenic resources objective is modification, a classification that allows management activities and mineral development such as coal mines, railroads, oil and gas wells, and pipelines to visually dominate the original characteristic landscape. Therefore, more development, a moderate number of facilities, higher fence densities, and intensive mineral development also may occur in the majority of the project area, particularly in the Highlight Bill Geographic Area.



Primitive conditions with minimal facility development are emphasized for the Broken Hills Geographic Area, as a whole. In the portion of the geographic area that overlaps the project area (i.e., Management Area 5.12), management emphasis is on balancing resource uses and opportunities, such as livestock grazing, wildlife habitat, dispersed recreation, minerals management, and timber harvest. Where mineral development occurs, activities are designed to be visually subordinate to the landscape in the mid- and background. Signs of motorized travel, hunting, hiking, timber harvest, mining, and livestock grazing may be evident.

Livestock grazing is the dominant land use throughout the project area, regardless of the geographic area. Minimal recreational use also occurs there. The Recreation Opportunity Spectrum class for the project area is semi-primitive motorized.

Wildlife species such as black-tailed prairie dogs (*Cynomys ludovicianus*), mule deer (*Odocoileus hemionus*), antelope (*Antilocapra americana*), mountain plover (*Charadrius montanus*), sage-grouse (*Centrocercus urophasianus*) and multiple raptor species inhabit sagebrush and grassland communities the area. Species identified by the USFS as management indicator species (MIS) for both geographic areas have been addressed in the Biological Evaluation section of this document.

A cultural resource survey of the area has been completed. Sites identified during the survey must and will be protected in accordance with State Historic Preservation Office direction.

This draft environmental impact statement (DEIS) documents and discloses the effects analyses for the proposed PPRM Mackey Road Relocation project. Through this assessment process, the USFS will determine where and under what term(s) and condition(s) PPRM may relocate the Mackey Road onto NFS land, while providing for protection of natural resources, as well as public access and safety.

## Decisions To Be Made

Through the environmental analysis process, the Forest Supervisor will review the alternatives analyzed in this DEIS, and then determine whether or not and, if so, where and under what conditions, the proposed activities would be authorized.

# ABBREVIATIONS AND ACRONYMS

AQD	Air Quality Division
AVF	Alluvial Valley Floors
BA/BE	Biological Assessment/Biological Evaluation
BLM	Bureau of Land Management
CBNG	Coal Bed Natural Gas
CCA	Candidate Conservation Agreement
CCAA	Candidate Conservation Agreement with Assurances
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CM	Centimeter
CR	County Road
DEIS	Draft Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act of 1973
FEIS	Final Environmental Impact Statement
FSH	Forest Service Handbook
FYPC	Fossil Yield Potential Classification
GCM	GCM Services, Inc.
GIS	Geographic Information System
GPS	Global Positioning System
LBA	Lease By Application
LRMP	Land and Resource Management Plan
LQD	Land Quality Division
MM	Millimeter
MIS	Management Indicator Species
NAAQS	National Ambient Air Quality Standards
NARM	North Antelope Rochelle Mine
NEPA	National Environmental Policy Act of 1969
NFS	National Forest System
NO	Nitrogen Oxide
NO <sub>2</sub>	Nitrogen Dioxide

NO <sub>x</sub>	Nitrogen Oxides
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
PAB	Palustrine Aquatic Bed
PEM	Palustrine Emergent
PM	Particulate Matter
PPRM	Peabody Powder River Mining, LLC
PRB	Powder River Basin
ROD	Record of Decision
SHPO	State Historic Preservation Office
SOPA	Schedule of Proposed Actions
TBNG	Thunder Basin National Grassland
T&E	Threatened and Endangered Species
USACOE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFS	U.S. Department of Agriculture Forest Service
USFWS	U.S. Fish and Wildlife Service
WDEQ	Wyoming Department of Environmental Quality
WGFD	Wyoming Game and Fish Department
WNV	West Nile Virus

# DOCUMENT STRUCTURE

The U.S. Forest Service (USFS) has prepared this draft environmental impact statement (DEIS) in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. This document discloses the direct, indirect, and cumulative environmental impacts that will result from the Proposed Action and other alternatives. The document is organized into four chapters:

*Chapter 1. Purpose and Need for Action:* This chapter includes a list of the Grassland Land and Resource Management Plan stipulations, standards, and guidelines that are applicable to the proposed project; management prescriptions for the project area; the purpose and need for the project; and a summary of the agency's proposal for achieving that purpose and need. This section also details how the USFS informed the public of the proposal and how the public responded.

*Chapter 2. Alternatives, including the Proposed Action:* This chapter provides a more detailed description of the agency's Proposed Action, as well as alternative methods for achieving the stated purpose. These alternatives were developed based on significant issues raised by the public and other agencies. This discussion also includes mitigation measures based on USFS requirements and the Grassland Land and Resource Management Plan Standards and Guidelines. Finally, this section provides a summary table of the environmental consequences associated with each alternative.

*Chapter 3. Affected Environment and Environmental Consequences:* This chapter describes the environmental effects of implementing the Proposed Action and other alternatives. Cumulative effects, which are reasonably foreseeable future actions conducted by any entity, of the Proposed Action also are discussed. Chapter 3 is organized into sections based on the following environmental resources: Heritage-Cultural Resources, Paleontological Resources, Wildlife Resources, Vegetation Resources, Soils, Hydrology, Land Use, Air Quality, and Economic and Social Conditions.

*Chapter 4. Consultation and Coordination:* This chapter provides a list of preparers and agencies consulted during the development of the DEIS.

*Chapter 5. Literature Cited:* This chapter lists literature referenced in the DEIS.

*Appendices:* The appendices provide more detailed information (including maps) to support the analyses presented in the DEIS.

Additional documentation may be found in the project planning record located at the Douglas Ranger District Office at 2250 East Richards Street, Douglas, Wyoming, 82633.

# CHAPTER 1. PURPOSE OF AND NEED FOR ACTION

## 1.1 Geographic Area Direction

The Thunder Basin National Grassland (TBNG) is comprised of approximately 572,000 acres of National Forest System (NFS) lands intermingled with over 1 million acres of private and state lands. The TBNG is divided into six Geographic Areas. Geographic Areas include management direction that is too specific to apply across the entire grassland or across several grasslands. The Proposed Action is mostly within the Hilight Bill Geographic Area, with approximately 1.6 non-contiguous miles crossing the western border of the Broken Hills Geographic Area.

### Desired Conditions

The desired condition on the TBNG is to allow continued, uninterrupted public access to NFS lands and surrounding land in the project area while allowing Peabody Powder River Mining, LLC (PPRM) to fully develop its existing coal leases at the nearby North Antelope Rochelle Mine (NARM). Relocation of the Mackey County Road (CR69) and Temporary Reno Road will accomplish both of these conditions. Related Grassland Land and Resource Management Plan (LRMP) goals and objectives are presented in Appendix 1 of this document.

### 1.1.1 Hilight Bill Geographic Area

The Hilight Bill Geographic Area encompasses approximately 100,780 acres of NFS land in the southwestern portion of the TBNG. This geographic area is located roughly parallel to Wyoming State Highway 59 from Bill to Wright, Wyoming. Fairly level plains with slopes of less than 15% characterize the topography of the area. Elevation ranges between 4,700 feet to 5,300 feet above sea level. The primary drainages in the geographic area are the headwaters of Antelope Creek (including tributaries Bates, Spring, and Porcupine Creeks), the Dry Fork of the Cheyenne River, and Dry Creek. The dominant vegetation includes big sagebrush, western wheatgrass (*Pascopyrum smithii*), green needlegrass (*Stipa viridula*), and blue grama (*Bouteloua gracilis*).

### Desired Conditions

Minerals exploration and development, and livestock grazing will be significant management activities in this geographic area. In some areas, restrictions on public use may be applied to ensure public safety and to avoid unreasonable interference with mineral operations. More mineral developments and a moderate number of facilities such as coal mines, railroads, oil and gas wells, and pipelines will be present and will often dominate the landscape in this geographical area. Facilities and landscape modifications will be visible, but reasonably mitigated to blend with natural features. Higher fence densities also may occur. In those

areas where mining is emphasized, reclamation activities will restore the area to a reasonable level of its pre-mining condition and to blend in with adjacent undisturbed areas.

In areas with other management emphases, existing vegetative diversity and structural conditions will be maintained and enhanced. This area will have a healthy and diverse mix of grasses, including the following species: western wheatgrass, needle-and-thread grass (*Hesperostipa comata*), green needlegrass, little bluestem (*Schizachyrium scoparium*), blue grama, and prairie junegrass (*Koeleria macrantha*).

The streams and riparian areas will be in proper functioning condition or moving towards proper functioning condition. Riparian areas and woody draws will be managed to maintain or enhance different age classes of herbaceous plants, shrubs, and trees. Desired riparian species include sedges, rushes, snowberry (*Symphoricarpos occidentalis*), wild rose (*Rosa* spp.), willow (*Salix* spp.), and cottonwood (*Populus* spp.), as well as other woody plants. Soils in this geographic area will have high infiltration rates and low soil compaction, resulting in minimal overland flow events.

### 1.1.2 Broken Hills Geographic Area

The Broken Hills Geographic Area includes about 157,440 acres of NFS lands in east-central Wyoming. It consists of the Rochelle Hills, Red Hills, Cow Creek Buttes, and the Downs area southeast of Bill, Wyoming. The topography of the area is characterized by rolling hills to steep escarpments. Elevation ranges from about 4,500 feet above sea level in the Downs area to about 5,200 feet in the Rochelle Hills. The primary drainages in this geographic area are Black Thunder Creek and its tributaries Little Thunder and HA Creeks, the main stem of Dry Creek and its tributaries Bobcat, Deer, and Little Rat Creeks, the Dry Fork of the Cheyenne River, and tributaries to Antelope Creek. The dominant vegetation includes Wyoming big sagebrush (*Artemisia tridentata wyomingensis*), needle-and-thread grass, blue grama grass, western wheatgrass, and ponderosa pine (*Pinus ponderosa*).

Approximately 1.6 non-contiguous miles of the Mackey Road Relocation construction corridor will cross NFS lands in the Broken Hills Geographic Area; 1.2 miles along the central portion of the route and 0.4 mile near its southern extent.

#### Desired Conditions

The desired condition for the overall geographic area is an open, scenic landscape with little evidence of human activity or influence. Mineral development and facilities will be present, but will be visually subordinate to the landscape in the general area. Natural outbreaks of native insects and diseases will be allowed to proceed without intervention unless a substantial threat to high-value resources exists. This area will have a healthy and diverse mix of grasses such as western wheatgrass, needle-and-thread grass, green needlegrass, little bluestem, blue grama, and prairie junegrass. Habitat suitability and effectiveness will be maintained for key wildlife

species. Stream, riparian, and soil conditions will be the same as those described for the Hilight Bill Geographic Area.

Primitive conditions with minimal facility development will be emphasized. Mineral Developments, such as oil and gas wells and pipelines, will be present but visually subordinate to the landscape in the mid and background. Pastures will be large.

## **1.2 Management Area Direction**

Management Areas are defined as parts of the grassland that are managed for a particular emphasis or theme. Each Management Area has a prescription that outlines the Theme, Desired Conditions, and Standards and Guidelines that apply to it (in addition to the Grassland-wide Standards and Guidelines). Prescriptions have been broken into eight major categories that range from least evidence of disturbance to most evidence of disturbance.

In the Hilight Bill Geographic Area, the proposed Mackey Road relocation falls within the Mineral Production and Development Management Area (8.4). In the Broken Hills Geographic Area, the proposed project is within the General Forest and Rangelands: Range Vegetation Emphasis Management Area (5.12).

### **1.2.1 Management Area 8.4-Mineral Production and Development**

#### **Desired Conditions**

Management Area 8.4 is managed for solid mineral operations. Mineral operations of all types are emphasized to effectively and efficiently remove available commercial mineral resources, concurrent with other ongoing resource uses and activities. Operations include development and production of solid minerals such as coal, bentonite, uranium, and hard rock that may involve open-pit mines, stock-piled overburden and top soil, and various ancillary facilities. Facilities and landscape modifications are visible but are reasonably mitigated to blend and harmonize with natural features. Reclamation activities restore the area to a reasonable level of its pre-mining condition. Grazing will occur, except on areas actively being mined; limited grazing also occurs once reclamation is sufficiently established and in the process of bond release.

Restrictions on public use occur to ensure public safety and to avoid unreasonable interference with mineral operations. Visitors can experience frequent encounters with people, heavy equipment, and noise.

## 1.2.2 Management Area 5.12-General Forest and Rangelands: Range Vegetation Emphasis

### Desired Conditions

This Management Area is managed primarily for the sustainability of physical, biological, and scenic values associated with woody vegetation and open grassland. Mineral development and facilities will be present, but will be visually subordinate to the landscape in the general area. Management emphasis targets a balance of resource uses and opportunities, such as livestock grazing, wildlife habitat, dispersed recreation, minerals management, and timber harvest, among others. Though some areas are forested, they usually do not produce commercial wood fiber because of poor site potential.

Recreation facilities may be present. Range and other management activities are coordinated with recreation so they do not conflict with the managed use season. Signs of motorized travel, hunting, hiking, timber harvest, mining and livestock grazing may be evident. Recreational use typically is moderate from spring through fall, with increased use during hunting seasons.

## 1.3 Purpose of and Need for Action

The USFS has identified a *need* for authorizing PPRM to conduct the activities associated with the relocation of a segment of Campbell County's Mackey Road and the Temporary Reno Road to allow NARM to fully develop existing federal coal leases WYW-179011, WYW-0321779, WYW-172413, WYW-172414, and WYW-151134, subject to the Mineral Leasing Act. The existing condition is that portions of these two roads overlie mineable coal within NARM's existing federal coal lease boundary. Full development of the federal coal leasing obligation will require that coal lying beneath those road segments be mined. The desired condition is to mine the coal beneath the roads, yet maintain public travel services provided by the roads. The *purpose* of this action is to relocate those segments of the Mackey and Temporary Reno roads outside the area to be mined in advance of mining and turn the relocated route over to Campbell County jurisdiction so that the underlying coal can be mined and public road services remain uninterrupted.

## 1.4 Proposed Action

The USFS proposes to authorize PPRM to relocate portions of the Mackey Road and Temporary Reno Road on NFS lands. After construction is complete, the USFS proposes to authorize an easement to Campbell County for use and maintenance of the new route as a county road. The new county road segment will maintain public access to private, state, and NFS lands east of projected mine activities.

The proposal includes construction and reconstruction of approximately 8.7 miles of county road constituting a new route for the Mackey Road. These activities will affect approximately 7.1



miles on NFS lands in Township 42 North, Range 69 West, Sections 6, 7, 8, 17, 21, 28, and 33; and Township 43 North, Range 69 West, Sections 29-31. Approximately 5.85 miles of those affected NFS lands will entail new road construction; the remaining 1.25 miles will involve reconstruction of the existing NFS Road #968 - School Creek Road. Once the project is complete, a 100-foot wide (50 feet either side of center) right-of-way easement will be processed to Campbell County. The total impacted acreage on NFS lands associated with this project is projected to be approximately 292.7 short-term acres (i.e., during construction) and 85.7 long-term acres (new infrastructure and post-construction maintenance within the easement to be transferred to the county). The design specifications for the new road will conform to current county road standards. Campbell County will maintain the road after the easement is complete.

Upon completion of the new road, approximately 6.1 miles of the existing Mackey Road within the NARM State of Wyoming, Permit to Mine #569 boundary will be vacated. Approximately 2.2 miles of the Temporary Reno Road (8.3 total miles) also will be vacated where it overlaps the current NARM coal lease and/or permit area. Most vacated road segments will be mined through and subsequently reclaimed in accordance with conditions specified in NARM's state mining permit.

## **1.5 Decision Framework**

Through the environmental analysis process, the Forest Supervisor will review the alternatives analyzed in this DEIS, and then determine whether or not and, if so, where and under what conditions, the proposed activities would be authorized.

## **1.6 Authorities and Regulations**

The following statutory authorities and regulations govern the issuance and administration of special-use authorizations on NFS lands that apply directly to the lands affected by the proposed authorization for the Mackey Road Relocation project.

*Title V, Federal Land Policy and Management Act of October 21, 1976, (43 U.S.C. 1761-1771).* Title V of the Federal Land Policy and Management Act (FLPMA) authorized the Secretary of Agriculture to issue permits, leases, or easements to occupy, use, or traverse NFS lands. FLPMA directs the United States to receive fair market value unless otherwise provided for by statute and provides for reimbursement of administrative costs in addition to the collection of land use fees (43 U.S.C. 1764(g)).

*Title 36, Code of Federal Regulations, Part 251, Subpart B.* This subpart provides direction for special uses management on NFS lands, including guidance pertaining to the special-use application process; terms and conditions of use; rental fees; fee waivers; termination, revocation, suspension, and modification of existing authorizations; and permit administration.

*Title 36, Code of Federal Regulations, Part 251, Subpart C.* This subpart provides a process for appeals of decision related to administration of special use authorizations on NFS lands.

Bankhead-Jones Farm Tenant Act of July 22, 1937, as amended (7 U.S.C. 1010-1012). Title III of this act directs and authorizes the Secretary of Agriculture to develop programs of land conservation and use to protect, improve, develop, and administer the land acquired and to construct structures thereon needed to adapt the land to beneficial use. Under the act, the Department of Agriculture may issue leases, licenses, permits, term permits, or easements for most uses, except rights-of-ways.

Mining and Minerals Policy Act of 1970. This Act declared it would be the continuing policy of the federal government and in the national interest to foster and encourage private enterprise in the development of economically sound and stable domestic mining industries, and the orderly and economic development of domestic mineral resources.

Mineral Leasing Act of 1920, as Amended by the Federal Coal Leasing Amendments Act of 1975. This Act, as amended, authorizes the federal agencies to lease coal reserves and prescribe conditions for protection of non-coal resources. It requires the BLM to secure consent from the surface management agency prior to leasing federal coal lands.

National Historic Preservation Act. This decision complies with the provisions of this Act and the American Indian Religious Freedom Act. Native American interests were consulted during this project.

Endangered Species Act. Compliance with this Act is addressed in this document. A Biological Assessment for this project has been completed and the USFWS is reviewing this DEIS and will provide comment on this project.

National Environmental Policy Act. The documentation for this project fully complies with this Act.

## **1.7 Public Involvement**

The project has been identified in the Schedule of Proposed Actions for the Medicine Bow-Routt National Forests since the third quarter (July through September) of 2009. The legal notice for public scoping and notice of comment was posted on May 1, 2011. The legal notice requested public comment on the proposal within 30 days after publication in the Laramie Boomerang newspaper. In addition, as part of the public involvement process, the agency sent a scoping letter to specific interested publics (permittees, federal, state, county, and local government agencies, and other persons who have expressed an interest in natural resource management on the Thunder Basin National Grassland) on April 18, 2011. Four public comment letters were received. A summary of the initial comments received and the disposition of those comments is provided in Appendix 2. After consideration of the public comments, as well as internal comments and issues, it was determined by the Interdisciplinary Team with approval by the Responsible Official to proceed with the project as an environmental impact statement. Therefore, on December 16, 2011 the Notice of Intent was published in the *Federal Register*.

The project proposal has been reviewed by the Campbell County Public Works Department and the Campbell County Road and Bridge Department. The proposal also was presented to the

Campbell County Board of Commissioners and the general public at a regular meeting of the Board in November 2010. At that public meeting, the Board of Commissioners was asked to initiate the procedure for vacation and relocation. On September 7, 2011, the Campbell County Board of Commissioners adopted a resolution initiating the procedure to vacate and/or relocate portions of the Mackey Road and Temporary Reno Road. At that meeting, the Commissioners also appointed viewers to examine the expediency of the Proposed Action. On December 19, 2011, the viewers submitted a report to the Board of County Commissioners that recommended proceeding with the project provided certain conditions were met. Public notice of Campbell County's decision to initiate procedures to relocate and vacate the sections of county road in question was published in the Gillette News-Record and given by certified mail to all those owning lands or claiming any interest in the lands to be affected, along with an invitation for all those with claims for damages or objections to the project to submit them in writing to the county clerk by a certain date. Written objections were submitted with the specified timeline, and a public hearing was held on May 1, 2012. At that hearing, the Board of County Commissioners for Campbell County determined that the project was deemed to be in the public interest (Road Resolution No. 1744). Notice of commencement of construction activities will be given to land owners, surface permittees, and other interest holders or parties who regularly occupy the lands which are the subject of this construction project.

## **1.8 Issues**

The USFS separated issues into two groups: key and non-key issues. Key issues were defined as those directly or indirectly caused by implementing the Proposed Action. Non-key issues are defined as those: 1) outside the scope of the Proposed Action; 2) already decided by law, regulation, Grassland Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The Council on Environmental Quality (CEQ) NEPA regulations require this delineation in Section 1501.7: "...identify and eliminate from detailed study the issues which are not key or which have been covered by prior environmental review (Section 1506.3)... ." A list of non-key issues and reasons regarding their categorization as non-key can be found at the Douglas Ranger District in the project record. The key issues identified during scoping or by the USFS Interdisciplinary Team regarding the need for an EIS rather than an environmental assessment are listed below:

- Long-term (i.e., irretrievable/irreplaceable) habitat impacts;
- Cumulative impacts on air quality and/or climate change;
- Potential effects on various wildlife populations, habitats, and hunting;
- Use of wildlife-friendly fencing;
- Potential effects of increased motorized public access to the TBNG;
- Use of best management practices for erosion control during construction and post-construction reclamation; and
- Control of invasive plant species (terrestrial and aquatic) during and post-construction.

See Appendix 2 for a complete list of initial public comments. Formal public comments will be solicited for this DEIS upon its release. All comments and USFS responses will be reflected in the FEIS for this project.

## **CHAPTER 2. ALTERNATIVES, INCLUDING THE PROPOSED ACTION**

This chapter describes and compares the alternatives considered for the proposed Mackey Road Relocation project on NFS lands in the Hilight Bill and Broken Hills Geographic Areas of the TBNG in northeast Wyoming. The alternatives also are presented in Table 2-1, defining the differences between each alternative, and providing a basis for choice among options by the decision-maker and the public.

### **2.1 Alternatives Considered in Detail**

NEPA requires the agency to “Study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources as provided by section 102(2)(E) of the Act” (40 Code of Federal Regulations [CFR] 1501.2(c)). It is required to develop reasonable alternatives to the proposed action that should still fulfill the purpose and need and address unresolved conflicts related to the proposed action.

#### **2.1.1 Alternative 1: No Action**

Alternative 1, the No Action alternative, was considered and evaluated. The No Action alternative enables the decision-maker (USFS) to compare the magnitude of environmental effects among alternatives to a baseline of the existing management conditions. Consideration of the No Action alternative is required by 40 CFR 1502.14 (d). This alternative would preclude development of the proposal as described in the Proposed Action.

NARM is currently authorized to recover coal under NFS lands within its current coal lease and state permit boundaries under an existin Special Use Authoriztion. Under the No Action alternative for this DEIS, the existing alignments of the Mackey County Road and the directly adjoining segment of the Temporary Reno Road will be retained, and no new road construction will occur. Coal mining associated with NARM will continue on private, state, and federal mineral estates west of the project area, but mining will not occur under the approximately 6.1 miles of the existing Mackey County Road and 2.2 miles of existing Temporary Reno Road that will otherwise be vacated and mined-through as described under the Proposed Action. The lack of an alternate route outside of active mine operations will pose a safety hazard to the general public traveling through the project area.

Other existing operations and infrastructure associated with oil and gas, utility and communication lines, livestock grazing, and other previously permitted activities within the project area also will be continued under the No Action alternative. An incremental loss of livestock and wildlife habitat will occur in the general vicinity as mining continues west of the project area, with some grazing permits affected and wildlife species affected until reclaimed habitats are established.

## **2.1.2 Alternative 2: Proposed Action**

The USFS proposes to authorize PPRM to relocate portions of the Mackey Road and Temporary Reno Road on NFS lands. The Proposed Action will occur outside NARM's current Wyoming Department of Environmental Quality (WDEQ) approved Permit to Mine (No. 569 T-6) and current coal lease boundary. Due to the location on NFS lands, the project is subject to USFS authorization for right-of-entry for access to construct the road. After construction is complete, the USFS proposes to authorize an easement to Campbell County for use and maintenance of the new route as a county road. The new county road segment will maintain public access to private, state, and NFS lands east of projected mine activities.

The proposal includes construction and reconstruction of approximately 8.7 miles of county road constituting a new route for the Mackey Road. These activities will affect approximately 7.1 miles on NFS lands in Township 42 North, Range 69 West, Sections 6, 7, 8, 17, 21, 28, and 33; and Township 43 North, Range 69 West, Sections 29-31. Approximately 5.85 miles of those affected NFS lands will entail new road construction; the remaining 1.25 miles will involve reconstruction of the existing NFS Road #968 - School Creek Road. Once the project is complete, a 100-foot wide (50 feet either side of center) right-of-way easement will be processed to Campbell County. The total impacted acreage on NFS lands associated with this project is projected to be approximately 292.7 short-term acres (i.e., during construction) and 85.7 long-term acres (new infrastructure and post-construction maintenance within the easement to be transferred to the county). The design specifications for the new road will conform to current county road standards. Campbell County will maintain the road after the easement is complete.

Upon completion of the new road, approximately 6.1 miles of the existing Mackey Road within the NARM permit boundary will be vacated. Approximately 2.2 miles of the Temporary Reno Road (8.3 total miles) also will be vacated where it overlaps the current NARM coal lease and/or permit area. Most vacated road segments will be mined through and subsequently reclaimed in accordance with conditions specified in NARM's state mining permit.

The proposed road will be constructed as an all-weather, gravel surface road with two travel lanes measuring 14 feet wide each (Appendix A, Exhibit A). The road will be constructed with a minimum 8-inch-thick base course/running surface of compacted, crushed gravel or gravel/milled asphalt mix (2 inches maximum crushed size) placed on top of a compacted, engineered sub-grade fill or cut. A geo-grid-type stabilization material may be used under the base course or within the cut/fill zone in areas where stability of the sub-base might be of concern. The road running surface will be sloped at 3% grade away from the center line (Appendix A, Exhibit A). Road shoulders and outslopes will not exceed a 4:1 grade from the running surface outward. Slopes will be designed to minimize erosion potential by employing a combination of currently accepted standard practices such as slope angle reduction, re-application of topsoil, re-vegetation with appropriate seed mixes designed to create the best cover, and, possibly, the use of mechanical runoff control features such as contour ditches, drop structures, etc. All ditches and drainage structures will be designed and constructed to

provide satisfactory control of surface drainage. Slope angle in ditches will be reduced to the extent possible to control drainage velocity and will probably need to be supplemented with mechanical control devices such as rip-rap (or other rock armoring), geo-web filled with rock or concrete, drainage culvert armoring and slope paving, check dams, and so on.

Approximately 0.5 mile of the entire 8.73-mile road length will involve major cut/fill construction. Cut and fill slopes will be constructed to minimize erosion. Engineered drainage structures consisting of multiple corrugated metal pipe or concrete box culverts will be installed to maintain post-construction habitat connectivity and prevent down-cutting and head-cutting where the road will cross Little Thunder Creek and School Creek. A Stormwater Pollution Prevention Plan permit will be obtained by the construction contractor and will remain in force until the construction area has been adequately re-vegetated and the slopes and ditches fully stabilized. In addition, the prime contractor will be required to provide a 1 year warranty to Campbell County against any construction deficiencies.

All disturbance on NFS lands will occur within a 300-foot to 700-foot wide corridor (Appendix 3, Exhibit A). Any yard area needed for temporary storage of geo-grid, culvert pipe, and accessories will be located within the construction corridor or on privately-owned or leased surface. Construction and maintenance vehicles will use existing highways, county roads, dirt roads, and the proposed construction right-of-way corridor to access and travel within the project area. Access to sources of construction water may require surface pipelines and pumps to be delivered via light vehicles and laid across native ground surface on public lands. Such access and activities will be limited to existing roads or the use of surface pipelines carefully installed across public land to avoid excessive disturbance of native ground surfaces.

Surface disturbance within the construction corridor will include: overland travel of vehicles and equipment; topsoil removal, stockpiling, and replacement; cut/fill activities; road base placement and compaction; gravel surfacing; fencing; and reclamation of ancillary areas. Dust control practices (application of water) will be used during construction to minimize dust emissions. The use of durable gravel surfacing will minimize fugitive dust from the completed road and comply with Campbell County Public Works Department construction requirements. Slope erosion associated with the new road construction will be controlled as described above. All construction and maintenance activities will cease when soils or road surfaces become saturated to the extent that the construction equipment is unable to stay within the right-of-way corridor/workspace and/or when activities could cause irreparable harm to other access roads or undisturbed soils.

Upon completion of the project, all road cuts, fill slopes, topsoil stockpiles, and other areas disturbed outside the permanent right-of-way as a result of this project will be reclaimed using appropriate techniques and seed mixes. Fencing and fence gates along the new right-of-way removed during construction will be designed and replaced based on input from grazing permittees, logical pasture delineations, and water availability.

## **2.2 Alternatives Considered but Eliminated from Detailed Study**

Federal agencies are required by NEPA to rigorously explore and objectively evaluate all reasonable alternatives that successfully meet the purpose and need, and then briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). Nineteen alternative routes to the Proposed Action were developed during early discussion of the project and are illustrated on Appendix 3, Exhibit A.

These alternative routes were eliminated from detailed study for one or more of the following reasons:

- a) They would result in a greater impact on NFS lands than the Proposed Action or No Action alternatives;
- b) They would result in greater impacts on wildlife and/or cultural site locations than the Proposed Action or No Action alternatives;
- c) Public safety issues were identified that were either not present or diminished by the Proposed Action or No Action alternative, including: additional, sharper, and/or longer horizontal or vertical curves; steeper grades; and an additional 90 degree intersection;
- d) Additional road lengths and surfacing would be required than under the Proposed Action, resulting in more surface disturbance and a greater number of affected landowners and/or land management agencies, including pasture integrity for landowners and members of the local Thunder Basin Grazing Association;
- e) Alternative routes would provide a less direct route for public traffic than the Proposed Action or No Action alternatives; and/or
- f) Higher construction and maintenance costs would be necessary than those associated with the Proposed Action and No Action alternatives.

## **2.3 Comparison of Alternatives**

This section provides a summary of the effects of implementing each alternative. Information in Table 2-1 focuses on the activities and effects documented in Chapter 3, where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Table 2-1. Disturbance summary for the Mackey Road Relocation project alternatives evaluated in the DEIS.

Features	Alternative 1 No Action	Alternative 2 Proposed Action
Miles of new road corridor	0.0	8.73
Miles of new road corridor on NFS lands	0.0	7.07
New construction corridor acreage <sup>2</sup>	0.0	358.29
New construction corridor acreage on NFS lands <sup>2</sup>	0.0	292.68
Completed road corridor acreage	0.0	105.74
Completed road corridor acreage on NFS lands <sup>3</sup>	0.0	85.67
Cultural Resources	No Effect	No Effect due to avoidance or mitigation
Paleontological Resources	No Effect	No Effect
Terrestrial Wildlife - T&E	No Effect	No Effect
Terrestrial Wildlife – Candidate	No Effect	May adversely affect individuals due to required mitigation*
Terrestrial Wildlife - Sensitive	May adversely affect individuals*	May adversely affect individuals*
Terrestrial Wildlife - MIS	Populations remain viable grassland wide	Project will not contribute to ability to maintain viable populations across the planning unit, with required mitigation.
Terrestrial Wildlife - Other	May adversely affect individuals*	May adversely affect individuals*
Plant Species - T&E	No Effect	No Effect
Plant Species - Sensitive	Not likely to cause a trend towards federal listing	Not likely to cause a trend towards federal listing
Plant Species – Local Concern	Assuming presence, no loss of viability	Assuming presence, no loss of viability
Social and Economics	Could lose 300 jobs if mine cannot continue operations	No jobs lost
Estimated Federal and State Coal Lease Revenue	\$586,000,000 lost	\$586,000,000 gained

\* May adversely impact individuals but is not likely to cause a trend to federal listing or loss of viability within the planning area.

<sup>1</sup> Acreages are calculated by multiplying the corridor length by its width (all in feet) and dividing that outcome by 43,560 feet<sup>2</sup> per acre.

<sup>2</sup> State land: 4.06 acres disturbance in completed road corridor.  
Private land: 16.0 acres disturbance in completed road corridor.  
Total Acres for completed road corridor: 85.67+4.06+16.0=105.7 total acres.



## 2.4 Monitoring

This section explains monitoring as it relates to implementation of the action alternative. Although monitoring information is usually included in the Record of Decision (ROD), it is worthwhile for the reader to have an understanding that the bulk of the on-the-ground work occurs once the final EIS is completed. Monitoring can determine whether the project-level decision is being implemented as planned (implementation monitoring) and, if so, whether the objectives identified are being achieved in a timely manner (effectiveness monitoring). If monitoring indicates that desired conditions are not being met, other pre-determined management options included in the project decision may be selected for implementation. If monitoring indicates that management is meeting standards, or is making measurable progress toward the desired conditions in an acceptable timeframe, the initial management options may continue (FSH 2209.13, Section 95). The USFS invites participation from other interested parties where feasible. Implementation and focused effectiveness monitoring are critical to determine if or when adaptive management changes should be made, and to guide the direction that those changes take.

Monitoring for this project will include implementation monitoring and effectiveness monitoring for the Grassland Plan Goals, Objectives, Standards, and Guidelines, as outlined in Appendix 1, and for any mitigation measures that are determined necessary in the ROD. The following additional resource-specific monitoring requirements also have been identified for the proposed project:

- The discovery of any and all antiquities or other objects of historic or scientific interest including, but not limited to, historic or prehistoric ruins, or artifacts as the result of operations under this plan shall immediately be brought to the attention of the Forest Supervisor. The permittee shall cease operations until authorized to proceed by the Forest Supervisor.
- The discovery of any and all fossils as the result of operations associated with the proposed project shall immediately be brought to the attention of the Forest Supervisor. The permittee shall cease operations until authorized to proceed by the Forest Supervisor.
- To help protect federally listed species, PPRM or the road construction operator will notify the Forest Supervisor should sightings of a federally listed species be discovered during construction or operation of the project. Those reports will occur regardless of whether the species was evaluated in this EIS.
- Annual monitoring of known wildlife features of concern (e.g., sage-grouse leks, raptor nests, etc.) within the area may be recommended to document occupancy.

## 2.5 Required Mitigation

The following mitigation measures will be required under the Proposed Action. During road construction, PPRM will be required to mitigate on-site impacts through one or more of the following:

- control of noxious weeds and invasive species will be performed by the road contractor during construction of the road; after the construction is complete and the road is dedicated, the control of noxious weeds will be the responsibility of Campbell County;
- slope erosion and runoff will be controlled during construction as described under the Proposed Action or by other appropriate best management practices, where necessary;
- common dust control practices (application of water) will be utilized to minimize impacts to air quality and visibility -- the company may choose to continue dust suppression for some time post-construction as a good faith effort;
- road contractor will adhere to timing restrictions (i.e., USFS Standards) designed to protect active wildlife features (i.e., grouse leks and raptor nests); and
- reclamation of newly disturbed areas beyond the final right-of-way will occur upon completion of construction, and will be accomplished using appropriate methods and seed mixes.

PPRM also will be required to implement off-site mitigation measures in appropriate sage-grouse habitat elsewhere on the TBNG before, during, or after construction. Such measures could include, but are not limited to:

- cheatgrass treatments;
- additional weed control outside the project area;
- conifer removal in sagebrush habitats;
- removal of silver sagebrush (*Artemisia cana*) in drainages through mowing;
- water development or enhancements;
- windmill removals and replacement with solar pumps;
- other measures identified collaboratively by PPRM and the USFS as benefitting sage-grouse.

## **CHAPTER 3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES**

Chapter 3 summarizes the existing physical, biological, social, and economic environments of the project area and the effects of implementing each alternative on that environment. It also presents the scientific and analytical basis for the comparison of alternatives presented in the alternatives chapter.

### **3.1 Affected Environment**

The Mackey Road and Temporary Reno Road are two main gravel county roads in southern Campbell County, Wyoming. These roads provide access to NFS lands, state lands, and private lands located between the paved Antelope and Edwards roads and south of Wyoming Highway 450. Both roads currently overlie existing coal leases being mined by NARM.

The proposed project occurs within the administrative boundary of the TBNG, Douglas Ranger District. This area is comprised of approximately 572,000 acres of NFS lands, intermingled with over 1 million acres of private and state lands. The TBNG is within the Powder River Basin (PRB), which encompasses northeast Wyoming and southeast Montana. The PRB is a structural basin (and distinct drainage basin) situated between the Bighorn Mountains to the west, the Laramie Mountains to the south and west, and the Black Hills and Hartville Uplift to the east; it extends into open country to the north in southeastern Montana. Elevations within the PRB range from approximately 6,000 feet along the Rochelle Hills Escarpment in the western portion of the basin to about 3,000 feet along the eastern border near the Black Hills.

The Proposed Action is mostly within the Hilight Bill Geographic Area. Minerals exploration and development and livestock grazing are, and will be, significant management activities in this geographic area. Mineral developments and facilities such as coal mines, railroads, oil and gas wells, and pipelines are, and will be, present and will often dominate the landscape. Facilities and landscape modifications will be visible, but reasonably mitigated to blend with natural features. In areas where mining is emphasized, reclamation activities will restore the area to a reasonable level of its pre-mining condition and to blend in with adjacent undisturbed areas. In some areas, restrictions on public use may be necessary to ensure public safety and to avoid unreasonable interference with mineral operations. More development and a moderate number of facilities will occur in this geographic area compared to other regions of the TBNG. Higher fence densities also may occur.

Approximately 1.6 non-contiguous miles of the construction corridor will cross NFS lands in the Broken Hills Geographic Area. The Management Area (5.12) for this portion of the geographical area is managed primarily for the sustainability of physical, biological, and scenic values associated with woody vegetation and open grassland. Management emphasis targets a balance of resource uses and opportunities, such as livestock grazing, wildlife habitat, dispersed recreation, minerals management, and timber harvest, among others. Mineral development and facilities will be present, but will be visually subordinate to the

landscape in the general area. Signs of motorized travel, hunting, hiking, timber harvest, mining, and livestock grazing may be evident in some areas.

Visual Resource Management objectives are to design and implement management activities to blend with the natural landscape. The Visual Quality Objective for the area is that of modification, a classification that allows management activities to visually dominate the original characteristic landscape. Facilities and landscape modifications are visible, but reasonably mitigated to blend with natural features to the extent possible.

The Scenic Integrity Objective for the project area is semi-primitive motorized. Livestock grazing is the dominant land use. Recreational use, primarily big game hunting, also occurs. Little camping, hiking, or mountain biking have been observed as occur elsewhere on the TBNG west of Highway 59.

The requested construction corridor will be approximately 300 feet wide along the majority of the route; the corridor will be 700 feet wide for approximately 4,500 feet of mixed surface ownership near the northern end of the project area. This will result in approximately 292.7 acres of short-term surface disturbance on NFS lands during construction. The completed road will have a right-of-way width of approximately 100 feet. Upon completion and acceptance by Campbell County, the USFS is expected to grant a permanent easement to Campbell County for the entire 100 foot corridor. Consequently, long-term post-construction impacts on NFS lands will be approximately 85.7 acres.

The proposed right-of-way is dominated by Big Sagebrush Shrubland, Upland Grassland, Ponderosa Pine Woodland, and Scoria (a.k.a. clinker) Grassland vegetation communities. The Big Sagebrush Shrubland vegetation community is composed of big sagebrush (*Artemisia tridentata*), needle-and-thread, western wheatgrass, prairie junegrass, and cheatgrass (*Bromus tectorum*). The Upland Grassland vegetation community has a similar plant species composition; however, big sagebrush cover is absent or at least less than 20%. The Scoria Grassland vegetation community is dominated by cheatgrass, broom snakeweed (*Gutierrezia sarothrae*), needle-and-thread, threadleaf sedge (*Carex filifolia*), blue grama, and prairie junegrass. Portions of the Scoria Grassland and the entire Ponderosa Pine Woodland vegetation communities have ponderosa pine and Rocky Mountain juniper (*Juniperus scopulorum*) present.

Topography varies from rolling hills in the Upland Grassland and Big Sagebrush Shrubland vegetation communities to steep hills in the Scoria Grassland and Ponderosa Pine Woodland vegetation communities. Both ephemeral and intermittent drainages are present at the lower elevations. No true perennial streams are present in the project area.

Land uses in the general vicinity include surface coal mining (west of the analysis area), livestock grazing (primarily sheep), oil and gas exploration and development (conventional and CBNG), and hunting and other forms of recreation. Numerous forms of equipment (medium and light duty), energy infrastructure (wells, pipelines, and power lines), and roads are scattered throughout the entire analysis area.

No current threatened or endangered (T&E) species (plants or animals) occur within the project area, nor are any T&E vertebrate species scheduled for release there or on immediately adjacent lands (i.e., within the 1.0-mile analysis area). Data from NARM's voluntary, long-term (2001-2012) monitoring of radio-collared birds demonstrate that the greater sage-grouse (*Centrocercus urophasianus*) (candidate species, hereafter, sage-grouse) does use a portion of the 4.0-mile sage-grouse analysis area with some regularity.

The upland habitats within the project area support a wide variety of common mammalian species including the pronghorn (*Antilocapra americana*), mule deer (*Odocoileus hemionus*), elk (*Cervus elaphus*), coyote (*Canis latrans*), black-tailed prairie dog (*Cynomys ludovicianus*), and various lagomorph (rabbits and hares) and rodent species. White-tailed deer (*Odocoileus virginianus*) and swift fox (*Vulpes velox*) could occur in riparian and grassland habitats, respectively, but neither species has been recorded in the analysis area during regular aerial or ground surveys conducted in many years since at least 1994.

Although suitable habitat is present in some areas, no plains sharp-tailed grouse (*Tympanuchus phasianellus*) have ever been observed during targeted surveys conducted on NFS or surrounding lands either in or near the proposed right-of-way over the years, or as incidental sightings during other wildlife surveys completed in that area during that period. The mountain plover (*Charadrius montanus*) also has never been recorded in the proposed right-of-way; this species was recorded in the general vicinity only once during the last two decades of annual monitoring. Numerous resident and seasonal avian species also occur in and near the project area, including several raptor and passerine species.

All or portions of 14 black-tailed prairie dog colonies have been historically documented in the 1.0-mile analysis area for this project. Nine of the 14 colonies had active portions within the analysis area in 2012, for a total of approximately 504 non-contiguous, active acres. Six of the nine active colonies were entirely or partially on NFS lands, encompassing approximately 274 non-contiguous acres (54% of total active acreage in analysis area). Only two colonies (about 8.8 non-contiguous, active acres) are intersected by the proposed construction corridor for the project. However, only one of those two colonies is on NFS lands, for a total of 0.2 acre (0.04% of total colony acreage in analysis area). The final right-of-way will span approximately 2.9 non-contiguous, active acres, but none of those acres will be on NFS lands. None of the prairie dog colonies in the project area have been designated for ferret reintroductions (refer to Management Area 3.63-USFS 2002, Grenier 2004).

The proposed construction corridor crosses Little Thunder Creek (intermittent) and School Creek (semi-perennial due to perennial springs along its east side) in the northern portion of the proposed relocation route in T43N, R69W, Sections 30 and 31, respectively. According to USFS resource specialists, two Region 2 (TBNG) sensitive fish species could potentially occur in those drainages within the Mackey Road Relocation project area: plains minnow (*Hybognathus placitus*) and flathead chub (*Platygobio gracilis*). The northern leopard frog (*Lithobates pipiens*) is the only Region 2 amphibian that could occur; no sensitive reptile species have been identified for this project. Other reptile and amphibian species recorded in the analysis area with any regularity are the prairie rattlesnake (*Crotalus viridis viridis*) and boreal chorus frog (*Pseudacris maculate*), respectively. Impacts on aquatic species will be

minimized by the timing (during low flow) of the proposed disturbance, and through the use of appropriate culverts to maintain post-construction habitat connectivity and prevent down-cutting and head-cutting. The timing of disturbance also will reduce potential impacts on reptiles, which typically hibernate during winter months.

Region 2 sensitive plant and animal species requiring different habitats, elevations, or other characteristics than those found in the Mackey Road Relocation analysis area were eliminated due to the lack of such features in the project area or the absence of physical disturbance of suitable habitats within the project corridor.

### **Impacts on the Environment**

Three separate types of impacts on the environment are identified: direct, indirect, and cumulative effects. Direct effects are caused by the action and occur at the same time and place. Indirect effects also are caused by the action but occur later in time or are farther removed in distance. Cumulative effects result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions (40 CFR 1508.7).

### **Cumulative Effects Protocol**

Cumulative effects are defined as the “impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions...can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

All projects listed in the Cumulative Effects section below have been implemented (past and present), are currently being developed (future), or are in progress (present and future). Additional project information can be found in the Medicine Bow-Routt National Forest, Douglas Ranger District Schedule of Proposed Actions (SOPA) at the following website: <http://www.fs.fed.us/nepa/fs-usda-pop.php/?project=34278>.

After the project implementation date is 5 years past, the project will be moved into the “Past” column of the cumulative effects table. Given the life of various projects, some project activities may become permanent features in the cumulative effects table for certain areas. This protocol is aimed at decreasing the length of the cumulative effects section of an environmental document, yet including all of the appropriate information so as to be thorough and forthcoming with the most current data.

### **Thunder Basin National Grassland Projects**

**Travel Management.** Travel Management for the TBNG. Contact: Misty Hays.

This project covers the entire Grassland. Review and analysis of the roads/trails for designation, include: opening trails/roads; closing trails/roads; converting roads to trails; decommissioning trails/roads; seasonal closures for trails/roads; and constructing trails/roads.

**Cheatgrass Management Analysis.** States of Colorado and Wyoming, including the following counties in those states: Garfield, Grand, Jackson, Moffat, Rio Blanco, Routt, Albany, Campbell, Carbon, Converse, Crook, Natrona, Niobrara, Platte, and Weston. Contact: Bob Mountain

This proposal will allow the aerial application of the herbicides Plateau and Journey to treat infestations of cheatgrass acres on the Medicine Bow-Routt National Forest and TBNG. This project is in analysis with a projected decision date of May 2012.

**Plan Amendment for Prairie Dog Management.** T37-48N, R62-73W and T53-55N, R68-71W. Contact: Cristi Painter.

The black-footed ferret reintroduction area boundary has been modified. This project adds management tools for controlling prairie dogs that are not currently available, such as lethal and non-lethal, landownership adjustment, and third-party solutions. Prescribed burning is currently being used to develop appropriate habitat for prairie dogs and associated species. Implementation began in March 2010.

**Land Management Planning Rule.** Contact: Larry Hayden.

The Department of Agriculture proposes to promulgate a new planning rule that will set out the process for development, revision, and amendment of National Forest System land management plans.

**Greater Sage-grouse Plan Amendment.** Contact: Misty Hays.

The TBNG is a cooperating agency in the development of a programmatic EIS to incorporate greater sage-grouse conservation measures into land management plans through plan amendment, including the TBNG plan. The Wyoming BLM is the lead agency.

### **Analysis Area Projects**

Given the above protocol, all activities and facilities located in the analysis area for the proposed project are listed in Table 3-1. Descriptions of specific projects are provided below. All USFS projects are listed with contact information. Other agency or non-agency projects do not include contact information.

Table 3-1. Past, present, and future projects in the analysis area for the PPRM Mackey Road Relocation project.

PAST <sup>a</sup>	PRESENT <sup>b</sup>	FUTURE <sup>c</sup>
Dispersed recreation	Dispersed recreation	Dispersed recreation
Grazing	Grazing	Grazing
Oil and Gas	Oil and Gas	Oil and Gas
Roads	Roads	Roads
Railroad	Railroad	Railroad
Power Line	Power Line	Power Line
Coal Mine	Coal Mine	Coal Mine
Pipeline	Pipeline	Pipeline

<sup>a</sup> Past projects are defined as all actions, on record, that were implemented  $\geq 5$  years ago.

<sup>b</sup> Present projects are defined as all actions, on record, that were implemented  $\leq 4$  years ago and have completed the appeal period of the NEPA process.

<sup>c</sup> Future actions are defined as all actions listed on the Schedule of Proposed Actions for the Douglas Ranger District that have not yet been implemented and are in the development process. The “Future” projects must have gone through internal scoping with District resource specialists.

\* Please see the section labeled “Additional CBNG Production Activity.”

### **Current Projects within the Proposed Project Area:**

#### **1. Wright Area Coal Lease by Application (LBA).** Minerals. Contact: Amy Ormseth.

Project is located east of Wright, Wyoming. The analysis for this project included the applications for coal leases in the Wright area. The aim of the project was the continuation of coal mining at the Black Thunder and North Antelope Rochelle mines. Analysis was completed in July 2010. Conjectured implementation date was winter 2012.

#### **2. RT Communications, Inc. Keeline to Wright.** Special Use. Contact: Geri Proctor.

T43N, R70W (Highways 450, 59, and 387). New fiber optic line will be placed in the right-of-way of Wyoming State Highways 450, 59, and 387. This will occur on 4.13 miles of NFS land. Conjectured implementation date is fall 2013.

#### **3. Antelope Mine Railroad Spur.** Minerals. Contact: Angela Bulla.

T40N, R71W, W $\frac{1}{2}$  SW $\frac{1}{4}$  Section 1; W $\frac{1}{2}$ , Section 12; W $\frac{1}{2}$ , Section 13; and SESE, Section 14, Converse County, Wyoming. Antelope Coal, LLC has requested an authorization to amend the existing Antelope Mine special use permit to allow expansion of the railroad spur



area associated with expansion and increased capacity of the coal loadout facility. Analysis in process.

**4. Thunder Basin Coal Company (TBCC)–Scoria Mining.** Minerals. Contact: Amy Ormseth.

NFS lands within the analysis area include portions of T43N, R70W, Sections 11-14 and 23-25, Campbell County, Wyoming. The USFS is proposing to authorize a permit to TBCC to allow acquisition of an adequate supply of aggregate construction material (clinker) to support required maintenance and changes in infrastructure necessary for mining activities. Analysis in process.

**5. North Antelope Rochelle Mine – Dewatering.** Minerals. Contact: Amy Ormseth.

T42N, R71W, W½ Section 35 (~ 320 acres); T42N, R71W, N½ N½ Section 25 and N½ NE¼ Section 26 (~ 247 acres), Campbell County, Wyoming. The USFS proposes to authorize Peabody Powder River Mining, LLC, operator of the North Antelope Rochelle Mine, right-of-entry access to NFS lands to conduct exploration drilling and install overburden dewatering wells and associated facilities to facilitate full development of their existing federal coal lease (WYW 150210). Conjectured implementation is July 2013.

**7. Black Thunder Mine – Installation/Construction of Dewatering Wells and Overstripping Area.** Minerals. Contact: Amy Ormseth.

The proposed dewatering wells are located on NFS lands and consist of two areas. The USFS has identified a need to authorize Thunder Basin Coal Company, LLC, operator of Black Thunder Mine, to construct dewatering wells and conduct topsoil and overburden overstripping activities. Conjectured implementation is August 2013.

**Additional CBNG production activity on non-NFS surface.**

In addition to the CBNG wells that have been drilled on NFS land within the proposed Mackey Road Relocation project area, CBNG production activities and infrastructure (producing wells and ancillary facilities: roads, above-ground and buried electric lines, buried water lines, and header buildings) also are occurring on non-NFS surface and should be considered in cumulative effects analyses. These wells and facilities are likely to exist through at least 2015. The wells will be eliminated over time either due to a lack of economically viable natural gas supply or to being mined through by the coal mine (for wells near active mines).

In addition to analyses conducted for this Environmental Impact Statement, portions of the proposed Mackey Road Relocation corridor were also included in impact analyses performed for the Wright Area Coal LBA final Environmental Impact Statement (refer to item 2c, above).

## **3.2 Heritage - Cultural Resources**

### **Existing Conditions**

A Class I and a Class III cultural inventory were performed in 2009 by GCM Services, Inc. (GCM) along the initial Mackey Road Relocation corridor. GCM completed additional Class I and Class III inventories in 2010 and 2012 to accommodate reroutes at the northern and southern ends of the corridors, respectively. Those reroutes were developed to avoid sites that were evaluated as eligible or potentially eligible for the National Register of Historic Places (NRHP) and to meet Campbell County requirements.

### **Methods**

A Class I report is a literature review and data search to determine whether previous cultural inventories have occurred in the project area and what, if anything, those surveys revealed. Sources for the Class I inventory include a Wyoming Cultural Records Office file search, the Wyoming Cultural Resource Information System on-line database, and GCM reports generated for other projects in the vicinity of the Mackey Road Relocation project.

The Class III cultural resources surveys were intensive and comprehensive pedestrian inventories of the proposed project area conducted by professional archaeologists and consultants. The surveys were designed to locate, identify, and record all prehistoric and historic cultural properties 50 years and older that have exposed surface manifestations. Transect intervals did not exceed 30 meters. All areas of subsurface exposure were examined particularly closely, including stream cut-banks, two-track road ruts, animal burrows, and anthills. Newly identified sites and isolated finds were recorded and plotted on U.S. Geological Survey 7.5 minute topographic maps. Site recording procedures included taking site photographs, drawing a sketch map, conducting shovel tests and/or probing with pin flags or probe devices, drawing and photographing artifacts with a high quality digital camera, also general notes were taken on the site and environment. Some tools and features were plotted either with compass and pacing with reference to a mapping station, or with a recreational grade Global Positioning System (GPS) unit.

Any cultural properties encountered during the survey were evaluated for their eligibility for inclusion to the NRHP. Determinations of eligibility are made by the managing federal agency in consultation with the State Historic Preservation Office (SHPO). If a property that is within the area of potential effect is determined to be eligible for the NRHP a treatment plan is then developed and the proper mitigation measures are spelled out. If a property is determined to be not eligible for inclusion in the NRHP, no further work is required and the property can be disturbed without any further analysis or mitigation.

### **Inventory Results**

During the course of this survey nine new sites were discovered, and four previously recorded sites were revisited and updated. Of the total number of archaeological sites ten are located on USFS federally owned lands, two are on privately owned lands, and one lays on both

USFS and private lands. The Forest Service has determined that one previously recorded site and one newly recorded site are *eligible* for inclusion to the NRHP. All Sites that are eligible for the NRHP will be avoided during all road construction activities.

Consultation with SHPO must be completed prior to the signing of the Record of Decision. At that time, those sites determined eligible for the NRHP though consultation would receive further protection or treatment. Impacts to *eligible* cultural resources shall not be permitted. It is the Forest Service's recommendation that all *eligible* sites be avoided during all road construction activities within. If sites cannot be avoided, they must be evaluated prior to disturbance. If *eligible* sites cannot be avoided, a data recovery plan must be implemented prior to disturbance. The lead federal and state agencies would consult with the Wyoming SHPO on the development of any testing, mitigation, or data recovery plans and the manner in which these plans are carried out. Sites that were determined as *not eligible* cultural sites may be destroyed without further work.

Cultural resources adjacent to the road may be impacted as a result of increased access to these areas. There may be increased vandalism and unauthorized collecting associated with recreational activity and other pursuits outside but adjacent to the road corridor. Unintended or uninformed impacts related to off-road traffic outside of but adjacent to the road corridor are the most frequent impacts to cultural resources.

## Environmental Consequences (Effects Analysis)

### **Alternative 1: No Action**

Under the No Action alternative, the existing alignments of the Mackey County Road and the directly adjoining segment of the Temporary Reno Road will be retained, and no new road construction will occur. Mining will not occur under the approximately 6.1 miles of the existing Mackey County Road and 2.2 miles of existing Temporary Reno Road within the NARM permit area.

The No Action alternative will result in no impact on cultural resources in the project area.

### **Alternative 2: Proposed Action**

The Proposed Action could impact two archeological sites: If it is not possible to adjust the alignment to avoid those two sites, formal testing is recommended to better characterize their contributing portions and to facilitate a mitigation plan, if needed.

SHPO's determination of eligibility for one site and the final disturbance risk will be required to evaluate the impact of the project on historic or prehistoric resources in the proposed Mackey Road Relocation corridor. If the two sites will not be disturbed there will be a *no adverse effect* to cultural resources. However, the following design criteria will apply:

- The discovery of any and all cultural resources that include but are not limited to, human remains, historic or prehistoric ruins, or artifacts as the result of operations

under this plan shall immediately be brought to the attention of the Forest Supervisor. The permittee shall cease operations until authorized to proceed by the Forest Supervisor.

### **Cumulative Effects for the Proposed Action**

Destruction or degradation of documented or undocumented cultural resources within the project area will represent a cumulative and permanent loss of information about the history of the area. The project area falls entirely outside current and projected permit areas for nearby surface coal mines. The Proposed Action will result in approximately 292.7 acres of short-term surface disturbance on NFS lands during construction, and approximately 85.7 acres of permanent disturbance upon completion and transfer of the road easement to Campbell County. Increased access due to the proposed project may promote the incidental collecting of artifacts. Surface disturbance outside the proposed project area, but in the vicinity, will result mainly from expansion of existing surface coal mines. Additional impacts have already occurred and will continue to occur from other mineral extraction processes, such as oil and gas (conventional and CBNG) exploration and development, and their associated infrastructure. Conventional oil and gas development, ranching, and recreational activities are expected to contribute minimally to cumulative impacts to cultural resources due to the relatively limited nature and/or scope of those activities. Nevertheless, additional resources may continue to be discovered and/or destroyed as a result of mineral extraction activities surrounding the project area. However, the application of Grassland Plan Standard and Guidelines, appropriate project design criterion, and existing monitoring and mitigation measures required for development of federal coal minerals, and oil and gas reserves in the cumulative impact analysis area for the proposed project effectively protect existing heritage resources on federal surface.

### **Short-Term Use/Long-Term Productivity, Unavoidable Adverse Impacts, Irreversible or Irretrievable Commitments of Resources for Cultural Resources**

No loss in long-term productivity is expected under either alternative.

No unavoidable adverse effects are expected under either alternative.

The character of the area will not be changed by either alternative. Therefore, no irreversible or irretrievable impacts on cultural resources will occur under either alternative.

## **3.3 Paleontological Resources**

### **Existing Conditions**

The region of the PRB where the project area is located is exclusively comprised of sedimentary rocks from the Lower-Middle Paleogene Period, dominated by the Paleocene Fort Union Formation with minor exposures of the Eocene Wasatch Formation. As discussed below, the Fort Union and Wasatch formations are typically assigned ages of Paleocene and Eocene, respectively. However, the Paleocene-Eocene boundary cannot be solely defined by the contact between formations.

The Fort Union Formation, found only in the southern portions of the project area, has been interpreted to represent a basin-wide depositional system that included an open lake system that was peripherally filled by fluvially-dominated deltas (Ayers 1986). The Wasatch Formation, also found in the southern portion of the project area, has been interpreted to represent a fluvial system dominated by meandering channel belts (Pocknall 1987).

The USFS Rocky Mountain Region has developed a classification system of geological formations according to their probability of containing vertebrate fossil resources referred to as the Fossil Yield Potential Classification (FYPC). The FYPC is designed to provide the USFS management with a way to prioritize protection of paleontological resources. Under this system, surficial formations are classified on a scale of 1 to 5 (with 5 as the highest paleontological sensitivity) to reflect the likelihood of containing vertebrate fossils. A pedestrian survey of the potentially productive portions of a project area is required for formations ranked as levels 3 through 5.

The Wasatch Formation has a FYPC of 5, which is described as “highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils and/or scientifically significant non-vertebrate (plant and invertebrate) fossils, and that are at risk of natural degradation and or human-caused adverse impacts (Appendix J, p. J-4 in USFS 2002).

The Fort Union Formation in the project area has been ranked as Class 3 under the FYPC system. Class 3 geologic units are defined by the USFS as “fossiliferous sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence; or sedimentary units of unknown fossil potential.”

## **Methods**

ARCADIS U.S., Inc. (ARCADIS) conducted a paleontological resource survey and prepared a subsequent report for the proposed Mackey Road Relocation in Campbell County, Wyoming. A background investigation was conducted to identify any publications, reports, collections records, or previous field surveys that detailed any paleontological discoveries in or near the project area. The USFS and the Bureau of Land Management (BLM) also were consulted to identify any known paleontological resources in the vicinity of the project area. No previously discovered paleontological localities were identified within the project area.

Based on the background research, the limited extent of bedrock exposures, and the previous experience of ARCADIS in this area, the overall potential for discovering paleontological localities in the project area was considered moderate to low. A linear survey encompassing approximately 0.25 mile on either side of the centerline of the proposed road relocation was conducted, focusing attention on bedrock exposures and planar surfaces lacking vegetative cover. Anthills also were investigated.

Each newly discovered locality was recorded on a field data sheet. Site recording involved a detailed contextual description of the geology, stratigraphy and lithology of each locality if applicable. Specimens from each locality were identified in the field to the extent possible. GPS coordinates were collected as point features for each locality using a Trimble *Geo-XT* with sub-meter accuracy. A detailed photo log, including pictures of the fossils and outcrops, was completed for each locality.

The USFS Paleontologist from the Douglas Ranger District performed an additional pedestrian survey in response to the relocation of the southern portion of the proposed road alignment in T42N, R69W, Section 28. Most of the surveyed area was covered by vegetation, typically with less than 10% bare ground exposure. However, the survey area for the new addition did include a number of bedrock exposures of early Paleogene non-marine sediments. Many of the bedrock exposures were of baked mudstone and siltstone (clinker) and were absent of fossils.

### **Survey Results**

Three distinct types of paleontological localities could potentially exist in the project area. The first consists of *in situ* paleontological resources weathering out from the point of original bedrock deposition. The second consists of identifiable paleontological resources for which the exact source location (and contextual information) cannot be determined. The third consists of unidentifiable paleontological resources (e.g. bone fragments) for which the source could not be determined and no contextual data could be recovered.

Three new paleontological localities were discovered during this survey. All three produced plant remains consisting of leaf impressions and/or petrified wood. Two of the localities were discovered in the Lebo Member of the Fort Union Formation and one was discovered in the Wasatch Formation. No vertebrate or invertebrate paleontological resources were discovered during this survey.

## **Environmental Consequences (Effects Analysis)**

### **Alternative 1: No Action**

Under the No Action alternative, the existing alignments of the Mackey County Road and the directly adjoining segment of the Temporary Reno Road will be retained, and no new road construction will occur. Mining will not occur under the approximately 6.1 miles of the existing Mackey County Road and 2.2 miles of existing Temporary Reno Road within the NARM permit area.

The No Action alternative will have no impact on paleontological resources in the project area.

### **Alternative 2: Proposed Action**

The Proposed Action will likely have no impact on paleontological resources in the project area.

No paleontological resources of scientific significance were found during the reconnaissance surveys for this project. The localities of resources found will not likely be affected by road construction due to the terrain in which they are located. Additionally, these localities contain relatively common specimens and do not require additional mitigation measures. It is recommended that this project be allowed to proceed as planned with a finding of no adverse

effect to paleontological resources. In the event that buried paleontological resources are discovered during construction operations, work should immediately be halted and the find reported to the Authorized Officer.

Because some potential to find resources during ground disturbance is possible, the following project design criterion will be applied:

- The discovery of any and all fossils or artifacts as the result of operations associated with the proposed project shall immediately be brought to the attention of the Forest Supervisor. The permittee shall cease operations until authorized to proceed by the Forest Supervisor.

### **Cumulative Effects for the Proposed Action**

Destruction or degradation of documented or undocumented paleontological resources within the project area will represent a cumulative and permanent loss of information about the history of the area. The project area falls entirely outside current and projected permit areas for nearby surface coal mines. The Proposed Action will result in approximately 292.7 acres of short-term surface disturbance on NFS lands during construction, and approximately 85.7 acres of permanent disturbance upon completion and transfer of the road easement to Campbell County. Increased access due to the proposed project may promote the incidental collecting of fossils. Surface disturbance outside the proposed project area, but in the vicinity, will result mainly from expansion of existing surface coal mines. Additional impacts have already occurred and will continue to occur from other mineral extraction processes, such as oil and gas (conventional and CBNG) exploration and development, and their associated infrastructure. Conventional oil and gas development, ranching, and recreational activities are expected to contribute minimally to cumulative impacts to paleontological resources due to the relatively limited nature and/or scope of those activities. Nevertheless, additional resources may continue to be discovered and/or destroyed as a result of mineral extraction activities surrounding the project area. However, the application of Grassland Plan Standard and Guidelines, appropriate project design criterion, and existing monitoring and mitigation measures required for development of federal coal minerals, and oil and gas reserves in the cumulative impact analysis area for the proposed project effectively protect paleontological resources on federal surface.

### **Short-Term Use/Long-Term Productivity, Unavoidable Adverse Impacts, Irreversible or Irretrievable Commitments of Resources for Cultural Resources**

No loss in long-term productivity is expected under either alternative.

No unavoidable adverse effects are expected under either alternative.

The character of the area will not be changed by either alternative. Therefore, no irreversible or irretrievable impacts on paleontological resources will occur under either alternative.

### **3.4 Wildlife Resources**

Wildlife analyses presented in this EIS tier to at least 13 separate NEPA analyses for projects on NFS lands that have already been approved by the USFS. Nine of the 13 analyses were for Biological Assessments/Biological Evaluations (BA/BEs), 3 were for environmental assessments, and 1 was for another EIS.

- School Creek Mine Ancillary Facilities Special Use Permit Environmental Assessment (2012)
- North Antelope Rochelle Mine North Pit 69 kV Power Line Relocation and School Creek Mine 69 kV Power Line Spur Environmental Assessment (2010);
- BLM Wright Area Coal LBA Final Environmental Impact Statement (2010);
- Thunder Basin Travel Management Plan BA/BE (2009);
- Antelope Road Relocation Environmental Assessment (2009);
- Highway 450 to School Creek Mine Power Line BA/BE (2008);
- NARM's LBA3 Umbrella BA/BE (2006);
- Kennecott Energy's Antelope Coal Mine 69 kV Transmission Line Project BA/BE (2005);
- Boss Draw Power Line BA/BE (2005);
- AVF Exchange Drilling BA/BE (2005);
- Teckla Bulk Transmission Substation Enlargement BA/BE (2002);
- Porcupine (a.k.a. Teckla) Distribution Substation and Tie Line BA/BE (2002); and
- East Teckla Power Distribution Lines for the Peabody Gas Wells BA/BE (2002).

All documents and Certifications of Acceptance or concurrence statements for those actions are on file with the Douglas Ranger District. The BLM coal document is available on that agency's website at <http://www.blm.gov/wy/st/en/info/NEPA/documents/hpd.html>.

Seven of those 13 analyses directly overlapped all or a portion of the Mackey Road Relocation analysis area (disturbance corridor and 1.0-mile or 4.0-mile perimeters, depending on the species). The remaining six analyses were farther away but encompassed the same habitats as those found in the analysis area.

The western two-thirds (66%) of the 4.0-mile analysis area for the Mackey Road Relocation project has been encompassed by annual monitoring efforts for nearby coal mines for many years. The northern half of the analysis areas (1.0-mile and 4.0-mile) has been monitored for various vertebrate species of concern annually from at least 1994 through early 2013, and considerably longer for some species (e.g., sage-grouse and nesting raptors) as part of annual wildlife monitoring programs for adjacent coal mines, the WGFD, and/or USFS. Monitoring in the southern half of the analysis areas occurred from 2010 through early 2013, with some follow-up surveys conducted along the entire right-of-way corridor in 2012. Some portions of the southern area were also surveyed prior to 2010 in conjunction with other overlapping projects. Surveys for all annual monitoring and NEPA projects were conducted by qualified biologists following appropriate agency protocols for data collection and reporting. All annual wildlife reports for coal mines and annual updates to current umbrella BA/BE analyses are on file with the Douglas Ranger District in Douglas, Wyoming and WDEQ in Sheridan or Cheyenne, Wyoming.



## Existing Conditions

### 3.4.1 Federally Listed Threatened, Endangered, and Candidate Vertebrate Species

Every federally endangered, threatened, candidate, and proposed species and their habitats that could potentially occur in the Douglas Ranger District, or that are located on, adjacent to, or downstream of the proposed project area and could potentially be affected, was considered and/or selected for evaluation. The state of Wyoming does not maintain a separate list of T&E species. Table 3-2 lists those species which are known to occur, or have suitable habitat within the analysis area. Analyses of federal T&E plant species are presented in Section 3.5 of this document.

Table 3-2. Occurrence and availability of species and suitable habitats for federally Endangered and Threatened vertebrate species within the Mackey Road Relocation project area.

Evaluated Species	Potential for Occurrence in Project Area	Occurrence in Local Area	Presence of Habitat in Project Area
Black-footed ferret <sup>E</sup> <i>Mustela nigripes</i>	Very Unlikely <sup>1,2,3</sup>	Undocumented <sup>1,2,3</sup>	Limited <sup>1,2,3</sup>
Greater sage-grouse <i>Centrocercus urophasianus</i>	Documented <sup>1,2</sup>	Documented <sup>1,2</sup>	Moderate <sup>1</sup>

<sup>1</sup> Based on USFWS block clearance for this species in black-tailed prairie dog colonies throughout Wyoming; USFS and TWC data collected from species-specific surveys in the analysis area; and baseline surveys and annual monitoring efforts conducted at local coal mines from 1984 through 2012 (summary reports of those data are on file with the USFS and WDEQ).

<sup>2</sup> Derived from Orabona et al. (2012) and/or the USFWS (2012).

<sup>3</sup> As indicated by the USFS (2002), WGFD (Grenier 2004), and/or USFWS (2004) regarding designated black-footed ferret reintroduction areas and/or block clearance designations.

<sup>E</sup> Classified as “Endangered” under the U.S. Endangered Species Act of 1973.

<sup>C</sup> Classified as a Candidate for listing under the U.S. Endangered Species Act of 1973.

No current T&E vertebrate species have been observed in or within 1.0 mile of the Mackey Road Relocation project area. No critical habitats for federally listed species have been designated by the U.S. Fish and Wildlife Service (USFWS 2012) in the project area or on surrounding lands. The endangered black-footed ferret (*Mustela nigripes*) is no longer listed for Campbell County, but it remains a federally listed species and is therefore discussed in this section. The candidate sage-grouse is known to occur in the project area and, therefore, also is included in this discussion.

### **Black-footed Ferret**

The black-footed ferret is largely a nocturnal mammal and an obligate associate of prairie dogs (*Cynomys* spp.). This species relies exclusively on prairie dog colonies for food and shelter (Clark and Stromberg 1987). Ferrets produce one litter per year, typically giving birth to four or five kits. Currently, an introduced group in south-central Wyoming is the only known black-footed ferret population within the state, though other populations are present elsewhere in the United States and Mexico.

The LRMP has designated a Management Area (3.63) specifically as Black-Footed Ferret Reintroduction Habitat. That area is outside the analysis area for the proposed project and has management direction specifically designed to maintain and enhance black-footed ferret habitat. This direction was consulted on at the time the LRMP was developed, and, because this project does not propose to change any of that direction, no additional consultation is required. The USFWS issued a block clearance for black-footed ferrets in all black-tailed prairie dog colonies throughout Wyoming on February 2, 2004 (file letter ES-61411/BFF/WY7746).

No black-footed ferrets or their sign have ever been documented in the project area or at nearby coal mines despite repeated targeted surveys. The small size (approximately 0.2 acre) of the active portion of the only prairie dog colony on NFS lands to be impacted during construction greatly diminishes its suitability for black-footed ferrets (Forrest et al. 1985, USFWS 1989). No colonies on NFS lands will be crossed by the final road right-of-way. Consequently, it is highly unlikely that black-footed ferrets occur in the coal region of the PRB.

### **Sage-grouse**

Sage-grouse rely on a variety of habitats within sagebrush dominated landscapes to reproduce and survive throughout the year. Early in the spring, grouse gather at breeding display sites called leks. Leks are usually in open areas (playas, ridge tops, sparse sagebrush, or burned areas) that are surrounded by dense sagebrush and escape cover. The surrounding area also typically represents nesting, loafing, and foraging habitat. This species generally does not respond positively to human activities and disturbances. The decline in sage-grouse populations across its range has been attributed, in part, to a loss in habitat or its function, and increased human disturbances during critical periods of its life cycle. These periods include breeding, nesting and, in some cases, during stressful times due to winter conditions (USFS 2002). Changes in fire regimes and the pervasiveness of invasive plants also have contributed to long-term, range-wide population declines (Knick et al. 2003).

Two active sage-grouse leks are present within 4.0 miles of the project area: Payne and Tracy Waterhole. Four inactive lek sites also are present in that analysis area: Rochelle, Wilson, Kort I, and Kort II. The USFS defines active leks as having attending males present during at least 1 of the most recent 5 years, whereas inactive leks have not had attending males present in the most recent 5-year period (USFS 2002, page 1-18). This is in contrast to the WGFD

lek management status definitions, which extend out to a 10-year assessment period. Because the project affects NFS lands, the USFS definitions are used for this analysis.

Peak male counts at both active leks have historically been low, with an average of approximately 7 males per year at the Payne lek and 15 males per year at the Tracy Waterhole lek since their respective discoveries. Peak male counts have declined at both sites over the last few years (pre-disturbance). As noted, all other leks in the analysis area are inactive by USFS classification.

Grouse were last documented at the Rochelle lek in 1999, and it was disturbed by mining activities in 2004. The Wilson and Kort leks were last active in 1997, 2004, and 2006, respectively. The Wilson and Kort II leks were disturbed by mine operations in 2011, and the Kort I lek was disturbed by mine activities in 2012. All mine related disturbance at and within 2.0 miles of these leks occurred during the non-breeding season to minimize potential impacts on breeding or nesting grouse. As stated, all four of these leks have been inactive for at least the last 5 years.

Results from the long-term annual monitoring and telemetry study have demonstrated that sage-grouse use of the project area has been concentrated in the central portion of the project area (i.e., construction corridor) and 4.0-mile analysis area since at least 2001. However, the quality of available sagebrush habitat varies widely throughout the area, ranging from heavily grazed, sparse sagebrush stands with little residual grasses to moderately dense stands of sagebrush intermingled with good quality residual grasses. Although some sagebrush is present, the western quarter of the analysis area is dominated by upland grassland communities, particularly in the southwestern corner. Consequently, the analysis area consists of both occupied and unoccupied habitat. More details regarding sage-grouse and their habitat within the analysis area are provided in the *Sensitive Species* and *Management Indicator Species* sections of this document.

## **Environmental Consequences (Effects Analysis)**

A summary of determinations of effect for vertebrate T&E species is provided in Table 3-3.

### **Alternative 1: No Action**

Under the No Action alternative, the existing alignments of the Mackey County Road and the directly adjoining segment of the Temporary Reno Road will be retained, and no new road construction will occur. Mining will not occur under the approximately 6.1 miles of the existing Mackey County Road and 2.2 miles of existing Temporary Reno Road within the NARM permit area.

The No Action alternative will have no new effects on T&E species in the project area.

Table 3-3. Determinations of effect and their primary justification for federally listed (threatened, endangered, candidate, proposed, petitioned) vertebrate species (through 2012) within the project area.

Evaluated Species	Effects Determination		Justification
	Alternative 1 <sup>1</sup> (No Action)	Alternative 2 (Proposed Action)	
Black-footed ferret	No Effect	No Effect	Block cleared in region by USFWS; no record of species presence; beyond USFS reintroduction MA; negligible disturbance of potential foraging habitat.
Greater sage-grouse (without mitigation)	Is likely to result in a trend to federal listing or loss of viability in the planning area	Is likely to result in a trend to federal listing or loss of viability in the planning area	Two active leks present within 4.0 miles; no leks disturbed but exposed to long-term increase in traffic and noise levels within 0.75 mile of nearest lek; construction during non-breeding season within 2.0 miles of active leks; final alignment beyond USFS surface occupancy limits and beyond view of nearest active lek; limited habitat impacts during construction but increased long-term habitat fragmentation; limited physical disturbance of other suitable seasonal habitats (see BE and MIS for additional information); increased long-term human presence; potential for increased use of travel corridors by mammalian predators.
Greater sage-grouse (with mitigation)	May adversely impact individuals <sup>2</sup>	May adversely impact individuals <sup>2</sup>	Impacts from above offset by required on-site and off-site mitigation measures to be implemented in sage-grouse habitat on the TBNG before, during, and/or following construction. Voluntary conservation measures implemented by PPRM within the NARM permit area, and at adjacent mines, under a pending CCAA/CCA <sup>3</sup> in northeast Wyoming also will help offset potential impacts from this project.

<sup>1</sup> Impacts under the No Action alternative will be due to implementation of previously permitted mining operations and other energy projects, as well as non-energy activities in the area.

<sup>2</sup> May adversely impact individuals but not likely to cause a trend to federal listing or loss of viability within the planning area.

<sup>3</sup> CCAA/CCA = Candidate Conservation Agreement with Assurances/Candidate Conservation Agreement; voluntary, large scale conservation program under development in collaboration with the USFWS and federal land management agencies in northeast Wyoming, including the TBNG.

### **Black-footed Ferret**

The No Action alternative will have no effect on current T&E species within the project area, as no such species occur or are scheduled for release there or on immediately adjacent lands (i.e., within the 1.0-mile analysis area). Indirect impacts on potential black-footed ferret

habitat will be limited to potential mortalities of prey items (individual prairie dogs) from existing vehicular traffic through, and/or recreational shooting in, the two affected colonies.

Potential black-footed ferret habitat within the general area is already protected by the current LRMP. Under that document, reintroduction habitat for black-footed ferrets will be maintained and enhanced; that reintroduction habitat is outside the analysis area for this project. Currently, no negative impacts are occurring in black-footed ferret habitat. With no anticipated change in the current use, no expected direct or indirect impacts on this habitat will occur.

### **Sage-grouse**

Only two of the six leks within the 4.0-mile analysis area are still active. Five of the six lek sites are within the existing permit area for one or more mines and, therefore, are already subject to mine related disturbance regardless of actions taken on this proposal. Four of those five sites have already been eclipsed by mine operations and disturbance at the fifth lek is imminent, even under the No Action alternative. The active Tracy Waterhole lek is on private surface, and is the only one of the six leks in the analysis area that is located beyond a current mine permit boundary. However, this lek is currently exposed to regular disturbance from road traffic on a scoria oil field road located within 100 yards and in view of the lek. Per USFS standards, surface disturbance on NFS lands within 2.0 miles of active leks occurs only during the non-breeding season, regardless of whether or not the lek itself is on NFS lands.

Due to the presence of existing disturbance near the Tracy Waterhole lek, implementation of the No Action alternative will not preclude additional short- or long-term effects on individuals or suitable habitat (occupied and unoccupied) in that area. The No Action alternative also will not delay or decrease the magnitude of those impacts within the Geographic Area or elsewhere in the Grassland. Furthermore, due to the downward trend of sage-grouse populations throughout the TBNG, even this alternative could conflict with the current Grassland Plan or future objectives to manage the area for sage-grouse. However, in addition to USFS Standards and Guidelines for sage-grouse, PPRM's long-term involvement in the ongoing, voluntary development of a joint Candidate Conservation Agreement with Assurances/Candidate Conservation Agreement (CCAA/CCA) in collaboration with the USFWS and federal land management agencies in northeast Wyoming will ensure that conservation measures for sage-grouse will continue to be implemented on- and off-site to offset impacts from mining in suitable sage-grouse habitat. Those voluntary measures were first initiated in 2006, and are ongoing; adjacent mines also are participating in this program. More details regarding impacts on sage-grouse and their habitat are provided in the *Sensitive Species* and *Management Indicator Species* sections of this document.

### **Alternative 2: Proposed Action**

The Proposed Action will result in approximately 292.7 acres of short-term surface disturbance on NFS lands during construction, and approximately 85.7 acres of permanent disturbance upon completion and transfer of the road easement to Campbell County.

### **Black-footed Ferret**

The Proposed Action will have no effect on current T&E species within the project area, as no such species occur or are scheduled for release there or on immediately adjacent lands (i.e., within the 1.0-mile analysis area). Indirect impacts on potential black-footed ferret habitat will occur on approximately 0.2 acre on NFS lands during construction; no colonies on NFS lands will be within the final right-of-way. Additional indirect impacts include mortalities of prey items (individual prairie dogs) from existing vehicular traffic through, and/or recreational shooting in, the two affected colonies.

Potential black-footed ferret habitat within the general area is already protected by the current LRMP. Under that document, reintroduction habitat for black-footed ferrets will be maintained and enhanced; that reintroduction habitat is outside the analysis area for this project. Currently, no negative impacts are occurring in black-footed ferret habitat. With no anticipated change in the current use, no expected direct or indirect impacts on this habitat will occur.

### **Sage-grouse**

Direct loss of, or injury to, individual sage-grouse residing within the project area could result from vehicle collisions from equipment associated with road construction or post-construction use by the general public. Additional direct effects could result from collision with new fence lines that might be built in previously undisturbed flight paths and/or use of new travel corridors by mammalian predators.

No grouse leks will be physically disturbed under the Proposed Action, either on or off NFS lands. The Tracy Waterhole lek is the nearest active lek to proposed disturbance. That lek is currently exposed to periodic oil and gas traffic on the scoria road approximately 100 yards west of the lek. The proposed construction corridor (project area) is approximately 0.75 mile west and beyond view of the Tracy Waterhole lek, which is beyond the USFS surface occupancy buffer distance (0.25 mile). The active Payne lek is approximately 3.8 miles west and beyond view of the project area. That lek is currently exposed to existing oil production, road traffic, and encroaching mine operations. Per USFS standards, surface disturbance on NFS lands within 2.0 miles of active leks occurs only during the non-breeding season, regardless of whether or not the lek itself is on NFS lands.

Despite these considerations, grouse and grouse habitat will be affected under the Proposed Action. As noted, the project will disturb approximately 292.7 short-term acres (i.e., during construction) and 85.7 long-term acres (new infrastructure and post-construction maintenance) on NFS lands. The latter total will be within the final 100-foot right-of-way for the relocated road. Much of the disturbance corridor will follow or be near existing roads and two-tracks, though the new right-of-way corridor will be considerably wider than current road conditions and designed to accommodate two-way traffic when finished. Suitable sage-grouse habitat does not occur along the entire length of the proposed construction corridor. However, construction activities and post-construction use of the relocated road will result in altered and/or fragmented sage-grouse habitats either not currently subject to such disturbance

or not currently exposed to traffic levels expected to occur upon completion of the project. The introduction of invasive and/or weedy plant species is also possible as equipment and other vehicles enter the project area during construction, operation, or maintenance of the new road. Increased levels of dust and noise also are likely to result from the project, both during and after construction. In addition to increased vehicular traffic, greater public access to NFS lands post-construction will likely lead to an increase in year-round recreational activities such as hiking and hunting that could be disruptive to any sage-grouse nesting or foraging in the area.

The timing of the project during the non-breeding season will minimize potential impacts on sage-grouse and their habitats during construction, but will not alleviate impacts, especially long-term impacts associated with the final right-of-way. Descriptions of required mitigation measures to offset impacts to sage-grouse are provided under *Required Mitigation*, below. Timely implementation of these measures in suitable habitat on- and off-site within the TBNG, along with additional voluntary conservation measures being implemented by PPRM and adjacent mines as part of the ongoing CCAA/CCA development, will sufficiently reduce overall impacts to maintain a viable population within the planning area. Additional details regarding potential impacts under the Proposed Action are described in the *Sensitive Species* and *Management Indicator Species* sections of this document.

### **Cumulative Effects for the Proposed Action**

According to 50 CFR, Part 402, Subpart A – General, Cumulative Effects are defined as “*those effects of future State or private activities, not involving Federal activities that are reasonably certain to occur within the action area of the Federal action subject to consultation.*”

Cumulative short- and long-term disturbances considered in this analysis arise from multiple sources that are currently present or could occur on all lands within the Mackey Road Relocation analysis area. Many of these activities include private or state lands or mineral ownership and may involve any or all jurisdictions. They also include direct and indirect impacts of past, present, and reasonably foreseeable future activities. All mine-related disturbances on existing coal leases have already been reviewed and approved by the USFS Douglas Ranger District as part of previous NEPA analyses for multiple projects at nearby coal mines.

Coal mining will continue on private, state, and federal mineral estates within the current mine permit areas for the nearby NARM and other overlapping mines. Other existing operations and infrastructure previously permitted to occur within the analysis area also will be continued, including (but not limited to) activities associated with scoria mining, oil and gas (conventional and CBNG), road construction and improvements, increased rail transportation lines, utility and communication lines, rural housing development, livestock grazing, hunting, and other forms of dispersed recreation. Within the reasonably foreseeable future, minerals extraction is expected to increase in portions of the analysis area.

Disturbances such as pipelines, power lines, roads, and facilities tend to fragment or reduce the effectiveness of remaining habitats within the vicinity of development. In addition, these

activities often result in increased noise and dust levels, new long-term or permanent facilities, potential introduction of invasive and/or weedy plant species, and a generally increased human presence, among others. Factors such as drought, the appearance of new diseases (e.g., West Nile Virus), and changes in the local fire regime also can compound cumulative impacts. An incremental loss of wildlife habitat will occur in the general vicinity as a result of several of these factors, with some wildlife species affected until reclaimed habitats are established in disturbed areas outside permanent rights-of-way or plant succession restores areas affected by natural causes such as fire or drought. A total of 85.7 additional acres of long-term disturbance on NFS lands will occur under the Proposed Action.

### **Black-footed Ferret**

While continued mineral development and its associated infrastructure are expected to continue on private and state lands, none of this is expected to occur in or near the Black-footed Ferret Reintroduction MA. To the best of the USFS's knowledge, no other known or proposed changes to these historical uses are planned. It appears that conditions on private and state-owned lands in the analysis area under the No Action alternative will not change dramatically from current conditions in the near future for this species.

### **Sage-grouse**

The analysis area encompasses both occupied and unoccupied sage-grouse habitat; NFS lands within the analysis area represent less than 0.01% of the entire TBNG. Long-term telemetry data in the vicinity have documented that sage-grouse use is concentrated in the central portion of the analysis area. While impacts can and have occurred in many places across the TBNG, some areas continue to provide suitable, occupied sage-grouse habitat that serves the region as a whole.

Nevertheless, cumulative impacts are expected to cause a direct loss or degradation of seasonal or year-round sage-grouse habitats, including long-term impacts in all habitat types found within existing and pending mine permit boundaries. Disturbances such as pipelines, power lines, roads, and other infrastructure tend to fragment or reduce the effectiveness of remaining habitats within the vicinity of development. Noise, increased human presence, new fence construction, increased predation (from wildlife and domestic pets), introduction of invasive and/or weedy plant species, and/or changes in fire regimes often accompany these types of development. The additional and synergistic impacts from other factors including, but not limited to, drought, disease, grazing, off-road vehicle use, and other forms of recreation also continue to adversely impact year-round sage-grouse habitat, especially sagebrush stands and nearby aquatic habitats (potential brood rearing habitat).

Per USFS standards, surface disturbance on NFS lands within 2.0 miles of active leks occurs only during the non-breeding season, regardless of whether or not the lek itself is on NFS lands. Energy extraction activities have requirements for reclamation of disturbed sites as areas are altered and resources are depleted. These restrictions and requirements will help mitigate future habitat losses, although the full benefits from reclaimed sagebrush stands will not be realized for many years, possibly decades, after the reclamation or decommissioning phases of the projects. Habitat losses due to rural housing developments should be considered



permanent. As with all lands administered on the TBNG, further consolidation of lands through land exchange will occur as opportunities arise.

Ongoing and previously permitted surface disturbance will continue in the analysis area regardless of whether or not the proposed project is approved. Therefore, precluding the project by selection of the No Action alternative would not eliminate additional short- or long-term effects on sage-grouse habitat, sage-grouse population viability, or the distribution of sage-grouse across the TBNG. However, the timely implementation of mitigation measures in suitable habitat on- and off-site within the TBNG, along with additional voluntary conservation measures being implemented by PPRM and adjacent mines as part of the ongoing CCAA/CCA development, will sufficiently reduce overall impacts to maintain a viable population within the planning area. More details regarding impacts on sage-grouse and their habitat are provided in the *Sensitive Species* and *Management Indicator Species* sections of this document.

### **Determination of Effects and Rationale**

The No Action alternative would have **no effect** on T&E species due to their documented absence from the area and lack of plans to reintroduce them.

Implementation of the Proposed Action also would have **no effect** on T&E species due to their documented absence from the area and lack of plans to reintroduce them.

#### **Black-footed Ferret**

The Proposed Action will have **no effect** on black-footed ferrets. Given the documented absence of this species during targeted surveys conducted throughout the region over the last two decades, the minimal (0.2 acre on NFS lands) physical disturbance of potential ferret habitat associated with the Proposed Action, the block clearance issued by the USFWS for black-tailed prairie dog colonies throughout Wyoming, and the distance of the analysis area from future reintroduction sites, the Mackey Road Relocation project will not affect black-footed ferrets. Furthermore, the proposed project will not conflict with the current Grassland Plan, or any future objectives to manage the area and reintroduce ferrets into the TBNG.

#### **Sage-grouse**

Without mitigation, the Proposed Action is likely to result in a trend to federal listing or loss of viability in the planning area for sage-grouse on the TBNG. Long-term telemetry data have documented that sage-grouse use limited portions of the analysis area, including lands near the proposed road corridor in some locations. Impacts such as increased levels of traffic, noise, dust, permanent infrastructure, human presence, and potential use of new travel corridors by mammalian predators will occur both during and after construction. These impacts will have both short- and long-term effects on sage-grouse habitat, sage-grouse population viability, and the distribution of sage-grouse across the TBNG.

However, the timely implementation of mitigation measures in suitable habitat on- and off-site within the TBNG, along with additional voluntary conservation measures being

implemented by PPRM and adjacent mines as part of the ongoing CCAA/CCA development, will sufficiently reduce overall impacts to maintain a viable population within the planning area. Therefore, the Proposed Action **may impact individuals but not likely to cause a trend to federal listing or loss of viability in the planning area.**

## **Required Mitigation**

The following mitigation measures will be required under the Proposed Action. During road construction, PPRM will be required to mitigate on-site impacts through the use of dust suppression methods and materials, and to adhere to timing restrictions (i.e., USFS Standards) designed to protect active lek sites. Reclamation of newly disturbed areas beyond the final right-of-way will occur upon completion of construction, and will be accomplished using approved methods and seed mixes. The company may voluntarily choose to continue dust suppression for some time post-construction as a good faith effort.

PPRM also will be required to implement off-site mitigation measures in appropriate sage-grouse habitat elsewhere on the TBNG before, during, or after construction. Such measures could include, but are not limited to: cheatgrass treatments, weed control, conifer removal in sagebrush stands, shrub removal in drainages (i.e., brood-rearing habitat) through mowing, water development or enhancement in brood-rearing habitats, windmill removals in favor of solar power, or other measures identified collaboratively by PPRM and the USFS as beneficial to sage-grouse.

## **Monitoring**

Surveys for federally listed species (including candidate species) will be conducted in the future, as determined necessary by the USFS, to monitor the effects of the project on populations.

### **3.4.2 USFS Region 2 - Sensitive Species**

Additional species considered are those identified by the Regional Forester as sensitive species. Species are classified as sensitive when they meet one or more of the following three criteria: 1) The species is declining in numbers or occurrences, and evidence indicates it could be proposed for federal listing as threatened or endangered if action is not taken to reverse or stop the downward trend; 2) The species habitat is declining, and continued loss could result in population declines that lead to federal listing as threatened or endangered if action is not taken to reverse or stop the decline; and 3) The species population or habitat is stable but limited. In addition to the above criteria, a ranking system is used to identify species for Sensitive status, which is outlined in USFS Manual 2670 - 2671.

## **Existing Conditions**

The USFS has developed a list of sensitive mammals, birds, amphibians, reptiles, fish, insects, mollusks, and plants for Region 2. That list was last updated in June and September 2011, as shown in Appendix C of the wildlife Biological Assessment/Biological Evaluation

for this project (on file with the Douglas Ranger District) and USFS Manual Chapter 2670, Digest 2672.11, Supplement No. R2\_2600-2011-1, Exhibit 01. Sensitive plant species are addressed in Section 3.5 (Vegetation Resources) of this EIS and in the vegetation Biological Assessment/Biological Evaluation document.

Thirty-three vertebrate species on the current Region 2 sensitive species list, and known or suspected to occur on the TBNG, were reviewed to determine which should be considered for full evaluation for the Mackey Road Relocation project. Table 3-4 lists those 33 species, including descriptions of their primary habitats, whether or not the species has been documented on the TBNG, and habitat suitability in the project area (i.e., habitat present in, near, or downstream of the proposed project area). If a species was known to occur in or near the proposed project area, or if suitable but unoccupied habitat was present and will be disturbed by the Proposed Action, then potential effects were evaluated. If suitable habitat was not present, or was present but will not be impacted, further analysis was not conducted. Justifications for eliminating species from further consideration are also included in Table 3-4, as appropriate.

Table 3-4. Current<sup>1</sup> USFS Region 2 sensitive species list for TBNG (vertebrate fauna): General habitat characteristics and presence<sup>2</sup>, species occurrence, and rationale if excluded from analysis for the PPRM Mackey Road Relocation project<sup>3</sup>.

Common Name <i>Scientific name</i>	Primary Habitats	Occurrence on TBNG	Suitable Habitat in Project Area	Rationale if Not Carried Forward for Analysis
Mammals				
Townsend's big-eared bat <i>Plecotus townsendii</i>	Caves and abandoned mines	Documented	Extremely Limited	Evaluated due to potential foraging habitat
Black-tailed prairie dog <i>Cynomys ludovicianus</i>	Grassland Shrub-grasslands	Documented	Suitable	Evaluated
Hoary bat <i>Lasiurus cinereus</i>	Coniferous forests, woodlands, grasslands, and shrublands	Documented	Limited	Evaluated due to potential foraging habitat
Fringed myotis <i>Myotis thysandes</i>	Coniferous forests, woodlands, grasslands, and shrublands,	Documented	Limited	Evaluated due to potential foraging habitat
Swift fox <i>Vulpes velox</i>	Grassland Shrub-grasslands	Documented	Moderate	Evaluated
Birds				
Northern goshawk <i>Accipiter gentilis</i>	Douglas fir/lodgepole pine forests, Aspen	Documented	None	No habitats within buffer, no impact to habitat
Grasshopper sparrow <i>Ammodramus savannarum</i>	Short-grass prairie, Shrub-steppe	Documented	Moderate	Evaluated
Sage sparrow <i>Amphispiza belli</i>	Shrub-steppe, montane shrublands	Documented	None	Project area is beyond typical range for this species
Burrowing owl <i>Athene cunicularia</i>	Grasslands, shrub-steppe	Documented	Suitable	Evaluated
American bittern <i>Botaurus lentiginosus</i>	Wetlands, marshes	Documented	Extremely Limited	Evaluated

Table 3-4. Continued.

Common Name <i>Scientific name</i>	Primary Habitats	Occurrence on TBNG	Suitable Habitat in Project Area	Rationale if Not Carried Forward for Analysis
Ferruginous hawk <i>Buteo regalis</i>	Grassland Shrub-steppe	Documented	Suitable	Evaluated
McCown's longspur <i>Calcarius mccownii</i>	Short-grass prairie, shrub-steppe	Documented	Limited	Evaluated
Chestnut-collared longspur <i>Calcarius ornatus</i>	Short-grass prairie	Documented	Limited	Evaluated
Greater sage-grouse <i>Centrocercus urophasianus</i>	Shrub-steppe	Documented	Moderate	Evaluated
Mountain plover <i>Charadrius montanus</i>	Short grasslands, prairie dog colonies	Documented	Limited	Evaluated
Black tern <i>Chlidonias niger</i>	Ponds, Lakes, Wetlands	Documented	None	No impact to open water bodies
Northern harrier <i>Circus cyaneus</i>	Grasslands	Documented	Suitable	Evaluated
Yellow-billed cuckoo <i>Coccyzus americanus</i>	Plains/Basin riparian	Documented	None	No habitat impacts
Olive-sided flycatcher <i>Contopus cooperi</i>	Boreal forests	Documented	None	No habitat impacts
American peregrine falcon <i>Falco peregrinus</i>	Tall cliffs, riverine systems, open prairie	Documented	Limited	Evaluated due to potential foraging habitat
Bald eagle <i>Haliaeetus leucocephalus</i>	Mature conifer or deciduous habitats, often near water	Documented	Suitable	Evaluated
Loggerhead shrike <i>Lanius ludovicianus</i>	Shrub-steppe	Documented	Suitable	Evaluated
Lewis' Woodpecker <i>Melanerpes lewis</i>	Low elevation conifer, plains/basin riparian	Documented	Limited	No habitat impacts
Long-billed curlew <i>Numenius americanus</i>	Grassland Shrub-steppe	Documented	Limited	Evaluated
Flammulated owl <i>Otus flammeolus</i>	Montane ponderosa pine	Species or habitat suspected, unconfirmed	Limited	No habitat impacts
Brewer's sparrow <i>Spizella breweri</i>	Shrub-steppe, montane shrublands	Documented	Moderate	Evaluated
Reptiles/Amphibians				
Northern leopard frog <i>Lithobates pipiens</i>	Persistent deep water, emergent vegetation	Documented	Suitable	Evaluated
Fish				
Plains minnow <i>Hybognathus placitus</i>	Larger streams	Documented	Suitable	Evaluated
Flathead chub <i>Platygobio gracilis</i>	Swift, turbid rivers	Documented	Suitable	Evaluated

Mountain Sucker <i>Catostomus platyrhynchus</i>	Low gradient streams with riffles, pools, runs	Undocumented	Unsuitable	Habitat Unsuitable
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Table 3-4. Continued.

Common Name <i>Scientific name</i>	Primary Habitats	Occurrence on TBNG	Suitable Habitat in Project Area	Rationale if Not Carried Forward for Analysis
Lake Chub <i>Couesius plumbeus</i>	Small, clear streams with permanent spring flow (headwaters)	Undocumented	Unsuitable	Habitat Unsuitable
Sturgeon Chub <i>Macrhybopsis gelida</i>	Main channels of turbid rivers or near sand or gravel bars	Undocumented	Unsuitable	Habitat Unsuitable
Finescale dace <i>Phoxinus neogaeus</i>	Cool, boggy lakes and sluggish streams	Undocumented	Unsuitable	Habitat Unsuitable

<sup>1</sup> June 2011 for mammals and birds, September 2011 for fish and amphibians.

<sup>2</sup> No high elevation coniferous forests or thick cottonwood-riparian corridors are present and/or will be disturbed in the project area; limited pine trees are present within 0.5 mile of the project area; beyond range of some species.

<sup>3</sup> The project area includes a 300-to-700-foot construction corridor across approximately 7.1 miles of NFS land, or approximately 292.7 acres.

Twenty-two of the 33 vertebrate species could potentially be impacted by the proposed project (Table 3-4). A summary of the determinations of effects under each alternative and primary justifications under the Proposed Action alternative are listed in Table 3-5 for each evaluated species. Species requiring different habitats (certain hawks and songbirds), elevations, or other features than those found in the analysis area were eliminated due to the lack of such features in the project area or the absence of physical disturbance of those habitats within the project corridor. The sage-grouse also is included in the Management Indicator Species section of this document.

A pre-field review of available information was conducted to assemble occurrence records and describe habitat needs and ecological requirements for each species. Sources of regional information included: Douglas Ranger District wildlife geographic information system (GIS) data (2010); TBNG Travel Management Plan BA/BE (2009), WGFD wildlife occurrence records (Orabona et al. 2012); Bureau of Land Management (BLM)-Buffalo Field Office wildlife data (2010); wildlife data collected by TWC at neighboring surface coal mines (NARM, School Creek, and Black Thunder [includes former North Rochelle Mine]) from the mid-1980s through early 2013; current scientific literature; and other available reports pertaining to the biology of those species. Wildlife survey boundaries and features within the project and analysis areas are depicted in Appendix A, Exhibits B and C, and Figure 1. All surveys were conducted according to current agency protocols; results from those efforts are included where surveys have been completed. All operators and the Douglas Ranger District will be notified immediately of any known or potential conflicts identified during those field surveys, and Standards and Guidelines will apply, as appropriate.

Table 3-5. Determinations of impact for 22 USFS Region 2 Vertebrate sensitive species evaluated under the No Action and Proposed Action alternatives for the PPRM Mackey Road Relocation project, and primary justifications under the Proposed Action.

Evaluated Species	Impacts Determination		Justification
	No Action Alternative <sup>1</sup>	Proposed Action Alternative	Proposed Action Alternative
<b>Mammals</b>			
Townsend's big-eared bat	May adversely impact individuals <sup>2</sup>	May adversely impact individuals <sup>2</sup>	Minimal risk of impacts; limited disturbance of foraging habitat; effects minimized by project timing during fall/winter months.
Black-tailed prairie dog	May adversely impact individuals <sup>2</sup>	May adversely impact individuals <sup>2</sup>	Limited risk of impacts; 0.2 acre physical disturbance/loss of habitat on NFS lands (0.04% total active colony acreage in analysis area).
Hoary bat	May adversely impact individuals <sup>2</sup>	May adversely impact individuals <sup>2</sup>	Limited disturbance of foraging habitat; effects minimized by project timing during fall/winter months.
Fringed myotis	May adversely impact individuals <sup>2</sup>	May adversely impact individuals <sup>2</sup>	Minimal risk of impacts; limited disturbance of foraging habitat; effects minimized by project timing during fall/winter months.
Swift fox	May adversely impact individuals <sup>2</sup>	May adversely impact individuals <sup>2</sup>	No sightings within 1.0-mile analysis area during long-term monitoring; limited suitable habitat; effects minimized by timing limitations.
<b>Birds</b>			
Grasshopper sparrow	May adversely impact individuals <sup>2</sup>	May adversely impact individuals <sup>2</sup>	No documented sightings or nesting efforts; limited potential habitat; effects minimized by timing limitations.
Burrowing owl	May adversely impact individuals <sup>2</sup>	May adversely impact individuals <sup>2</sup>	No documented nesting efforts in project area over last 20+ years; few sightings in area; 0.2 acre habitat disturbance in active prairie dog colony on NFS lands; effects minimized by timing limitations.
American bittern	May adversely impact individuals <sup>2</sup>	May adversely impact individuals <sup>2</sup>	No documented presence in area over last 20+ years; limited potential habitat; effects minimized by timing limitations.
Ferruginous hawk	May adversely impact individuals <sup>2</sup>	May adversely impact individuals <sup>2</sup>	No physical impacts on known nest sites; limited disturbance of foraging habitat; increased risk of vehicular collisions; effects minimized by timing limitations.
McCown's longspur	May adversely impact individuals <sup>2</sup>	May adversely impact individuals <sup>2</sup>	Few sightings in area; no documented nesting efforts; limited suitable habitat present; effects minimized by timing limitations.
Chestnut-collared longspur	May adversely impact individuals <sup>2</sup>	May adversely impact individuals <sup>2</sup>	No sightings in area; no documented nesting efforts; limited suitable habitat present; effects minimized by timing limitations.

Table 3-5. Continued.

Evaluated Species	Impacts Determination		Justification
	No Action Alternative <sup>1</sup>	Proposed Action Alternative	Proposed Action Alternative
Greater sage-grouse (without mitigation)	Is likely to result in a trend to federal listing or loss of viability in the planning area	Is likely to result in a trend to federal listing or loss of viability in the planning area	Two active leks present within 4.0 miles; no leks disturbed but exposed to long-term increase in traffic and noise levels within 0.75 mile of nearest lek; construction during non-breeding season within 2.0 miles of active leks; final alignment beyond USFS surface occupancy limits and beyond view of nearest active lek; limited habitat impacts during construction but increased long-term habitat fragmentation; limited physical disturbance of other suitable seasonal habitats (see BE and MIS for additional information); increased long-term human presence; potential for increased use of travel corridors by mammalian predators.
Greater sage-grouse (with mitigation)	May adversely impact individuals <sup>2</sup>	May adversely impact individuals <sup>2</sup>	Impacts from above offset by required on-site and off-site mitigation measures to be implemented in sage-grouse habitat on the TBNG before, during, and/or following construction. Voluntary conservation measures implemented by PPRM within the NARM permit area, and at adjacent mines, under a pending CCAA/CCA <sup>3</sup> in northeast Wyoming also will help offset potential impacts from this project.
Mountain plover	May adversely impact individuals <sup>2</sup>	May adversely impact individuals <sup>2</sup>	One documented sighting and no nesting efforts in 1.0-mile analysis area over last 20+ years; 0.2 acre physical disturbance/loss of habitat on NFS lands (0.04% total active colony acreage in analysis area); effects minimized by timing limitations.
Northern harrier	May adversely impact individuals <sup>2</sup>	May adversely impact individuals <sup>2</sup>	No documented nesting efforts in project area over last 20+ years; few sightings in area; effects minimized by timing limitations.
American peregrine falcon	May adversely impact individuals <sup>2</sup>	May adversely impact individuals <sup>2</sup>	Extremely limited use of project area by foraging birds; no impact to nest sites; increased risk of vehicular collisions; effects minimized by timing limitations.
Bald eagle	May adversely impact individuals <sup>2</sup>	May adversely impact individuals <sup>2</sup>	Limited use of project area by foraging birds; no physical impact to nests or winter roost sites; increased risk of vehicular collisions; effects minimized by timing limitations; visual barriers present between project area and historic winter roost sites.
Loggerhead Shrike	May adversely impact individuals <sup>2</sup>	May adversely impact individuals <sup>2</sup>	No documented nesting efforts; few sightings in area; limited suitable nesting habitat; effects minimized by timing limitations.
Long-billed curlew	May adversely impact individuals <sup>2</sup>	May adversely impact individuals <sup>2</sup>	No documented nesting efforts; few sightings in area; effects minimized by timing limitations.

Table 3-5. Continued.

Evaluated Species	Impacts Determination		Justification
	No Action Alternative <sup>1</sup>	Proposed Action Alternative	Proposed Action Alternative
Brewer's sparrow	May adversely impact individuals <sup>2</sup>	May adversely impact individuals <sup>2</sup>	Presumed nesting efforts though limited sightings in area; moderate suitable habitat; effects minimized by timing limitations.
Reptiles/Amphibians			
Northern leopard frog	May adversely impact individuals <sup>2</sup>	May adversely impact individuals <sup>2</sup>	Limited disturbance to habitat during low flow; use of appropriate culverts to maintain post-construction habitat connectivity and prevent down-cutting and head-cutting.
Fish			
Plains minnow	May adversely impact individuals <sup>2</sup>	May adversely impact individuals <sup>2</sup>	Limited disturbance to habitat during low flow; use of appropriate culverts to maintain post-construction habitat connectivity and prevent down-cutting and head-cutting.
Flathead chub	May adversely impact individuals <sup>2</sup>	May adversely impact individuals <sup>2</sup>	Limited disturbance to habitat during low flow; use of appropriate culverts to maintain post-construction habitat connectivity and prevent down-cutting and head-cutting.

<sup>1</sup> Impacts under the No Action alternative will be due to implementation of previously permitted mining operations and other energy projects, as well as non-energy activities in the area.

<sup>2</sup> May adversely impact individuals but not likely to cause a trend to federal listing or loss of viability within the planning area.

<sup>3</sup> CCAA/CCA = Candidate Conservation Agreement with Assurances/Candidate Conservation Agreement; voluntary, large scale conservation program under development in collaboration with the USFWS and federal land management agencies in northeast Wyoming, including the TBNG.

## Environmental Consequences (Effects Analysis)

As noted, a summary of the determinations of effects under each alternative and their primary justifications are listed in Table 3-5 for each evaluated species.

### Alternative 1: No Action

Under the No Action alternative, the existing alignments of the Mackey County Road and the directly adjoining segment of the Temporary Reno Road will be retained, and no new road construction will occur. Mining will not occur under the approximately 6.1 miles of the existing Mackey County Road and 2.2 miles of existing Temporary Reno Road within the NARM permit area.

Most of the 22 sensitive species evaluated have either not been documented in the analysis area, or occur seasonally or infrequently. Any species present are currently subject to injury or loss due to predation (avian and/or mammalian), collision with vehicles on existing roads, and/or current recreational shooting of prairie dogs in limited portions of the analysis area.



As those impacts are already present, selection of the No Action alternative will not reduce or eliminate existing risks to these species.

The No Action alternative will not conflict with the current Grassland Plan, or any future objectives to manage the TBNG for 21 of the 22 sensitive species evaluated. Sage-grouse are discussed separately, below.

### **Sage-grouse**

Details for sage-grouse was previously covered in the federally listed (threatened, endangered, candidate, proposed, or petitioned) section above in 3.4.1.

### **Alternative 2: Proposed Action**

Brief discussions of the status, distribution, and local occurrence of each evaluated species, as well as the potential direct and indirect effects are presented in the wildlife Biological Assessment/Biological Evaluation for the PPRM Mackey Road project, on file with the Douglas Ranger District. A summary of the determinations for the 22 evaluated sensitive species and the justification for those determinations is presented in Table 3-57.

Suitable habitats for each of the 22 analyzed sensitive species occur within the analysis area, though the locations and/or extent of such habitats, including whether or not such habitat is occupied, vary widely by species. Direct loss of, or injury to, individuals residing within the project area could result from vehicle collisions from equipment associated with road construction or post-construction use by the general public. Additional direct effects could result from collision with new fence lines that might be built in previously undisturbed flight paths and/or use of new travel corridors by mammalian predators.

As described above, construction activities and post-construction use of the relocated road will result in altered and/or fragmented habitats (breeding, roosting, and/or foraging) either not currently subject to such disturbance or not currently exposed to the levels expected to occur upon completion of the project. Although such disturbances will occur along or near existing roads and two-tracks, the new road alignment will be considerably wider and result in increased levels of traffic, noise, and dust along its route both during and after construction. The introduction of invasive and/or weedy plant species is also possible as equipment and other vehicles enter the project area during construction, operation, or maintenance of the new road. In addition to increased vehicular traffic, greater public access to NFS lands post-construction will likely lead to an increase in year-round recreational activities such as hiking and hunting that could be disruptive to any USFS sensitive species nesting or foraging in the area.

The timing of the project during the non-breeding season will minimize potential impacts on most species and their habitats during construction, but will not alleviate such impacts, especially long-term impacts associated with the final right-of-way. Reclamation of disturbed areas outside the final right-of-way will occur upon completion of construction, and will eventually replace foraging and other potential habitats for several species. However, restoration of sagebrush habitats could take decades to achieve.

Under the Proposed Action, the direct and indirect effects on each species will be minimized by the following factors:

1. the timing of the project during the non-breeding season;
2. the relatively limited maximum acreage of surface disturbance on NFS lands:
  - a. 292.7 short-term acres within a 300-to-700-foot-wide corridor, and
  - b. 85.7 long-term acres within a 100-foot corridor;
3. the location of portions of the new right-of-way within existing disturbance corridors;
4. the use of existing roads and two-tracks to access the construction area;
5. the primarily upland habitats in the project area;
6. the documented lack of some species of concern during long-term (1994 through early 2013, or longer) annual monitoring in the majority of the analysis area;
7. the use of appropriate erosion control and culvert structures designed to minimize erosion and maintain post-construction habitat connectivity, respectively;
8. the use of dust control measures during construction;
9. control of weeds and invasive species during and after construction;
10. required reclamation of disturbed areas outside the final road alignment;
11. additional required mitigation measures for impacts on sage-grouse; and
12. the continuous nature of the road once it is completed (allowing for acclimation).

These factors apply regardless of the species. Additional mitigation measures will be required for sage-grouse, which will be described under that subheading.

### **Sage-grouse**

Details and summary of impacts are discussed in detail above and remain the same for sage-grouse was previously covered in the federally listed (threatened, endangered, candidate, proposed, or petitioned) section above in 3.4.1 as they do as a sensitive species.

### **Cumulative Effects for the Proposed Action**

Cumulative impacts are defined under the NEPA process as the incremental impacts of past, present, and reasonably foreseeable future actions, including the proposed action, conducted by any entity (federal, state, private, etc.). Due to the continuation of previously approved operations, implementation of either the Proposed Action or No Action alternative could contribute to cumulative impacts for all evaluated USFS Region 2 sensitive species (TBNG), though to varying degrees.

General short- and long-term cumulative effects under the Proposed Action are the same as those described for federally listed species, above, with disturbances arising from multiple sources currently present or potentially occurring on lands within the Mackey Road Relocation analysis area. Examples of such disturbances include, but are not limited to, energy projects, transportation infrastructure, utility and communication lines, grazing, and various forms of recreation. Minerals extraction is expected to increase in portions of the analysis area within the reasonably foreseeable future. Disturbances such as pipelines, power

lines, roads, and facilities tend to fragment or reduce the effectiveness of remaining habitats within the vicinity of development. In addition, these activities often result in increased noise and dust levels, new long-term or permanent facilities, potential introduction of invasive and/or weedy plant species, and a generally increased human presence, among others. Factors such as drought, the appearance of new diseases, and changes in the local fire regime also can compound cumulative impacts. An incremental loss of wildlife habitat will occur in the general vicinity as a result of several of these factors, with some wildlife species affected until reclaimed habitats are established in disturbed areas outside permanent rights-of-way or plant succession restores areas affected by natural causes such as fire or drought. A total of 85.7 additional acres of long-term disturbance on NFS lands will occur under the Proposed Action.

For TBNG sensitive species, the overall result of implementing either alternative for the proposed project will be that some individuals may be lost (Table 3-5). For most species, cumulative impacts are not expected to significantly reduce the size or viability of either their local populations or the Grassland-wide populations. Neither the Proposed Action nor the No Action alternative will conflict with the current Grassland Plan, or any future objectives to manage the TBNG for 21 of the 22 sensitive species evaluated. However, due to cumulative impacts, both project options are likely to result in a trend to federal listing or loss of viability in the planning area for sage-grouse on the TBNG. Consequently, sage-grouse are discussed separately, below.

Specific cumulative impacts on sensitive species have been analyzed by habitat associations, below. Mixed sagebrush-grasslands, upland grasslands (including prairie dog colonies), and limited aquatic and wetland resources occur within the proposed project area; the majority of project-related disturbances will occur in upland grassland habitats. Only a small (0.2 acre) portion of one active prairie dog colony falls within the project area (construction corridor) itself. That acreage represents less than 0.04% of the total acreage of active colonies within the surrounding 1.0-mile analysis area. A total of 3.99 non-contiguous acres of wetlands were delineated on NFS lands within the Mackey Road analysis area (right-of-way and 1,000-foot buffer). Few, if any, trees will be disturbed in the project area, though cottonwoods and pine breaks are present along the two primary creeks and on some ridges along the proposed right-of-way.

### **Sage-grouse**

As noted under the federally listed species discussion, the analysis area encompasses both occupied and unoccupied sage-grouse habitat. Long-term telemetry data in the vicinity have documented that sage-grouse use is concentrated in the central portion of the analysis area. While impacts can and have occurred in many places across the TBNG, some areas continue to provide suitable, occupied sage-grouse habitat that serves the region as a whole.

Nevertheless, cumulative impacts are expected to cause a direct loss or degradation of seasonal or year-round sage-grouse habitats, including long-term impacts in all habitat types found within existing and pending mine permit boundaries. Disturbances such as pipelines, power lines, roads, and other infrastructure tend to fragment or reduce the effectiveness of remaining habitats within the vicinity of development. Noise, increased human presence, new fence construction, increased predation (from wildlife and domestic pets), introduction of

invasive and/or weedy plant species, and/or changes in fire regimes often accompany these types of development. The additional and synergistic impacts from other factors including, but not limited to, drought, disease, grazing, off-road vehicle use, and other forms of recreation also continue to adversely impact year-round sage-grouse habitat, especially sagebrush stands and nearby aquatic habitats (potential brood rearing habitat).

Per USFS standards, surface disturbance on NFS lands within 2.0 miles of active leks occurs only during the non-breeding season, regardless of whether or not the lek itself is on NFS lands. Energy extraction activities have requirements for reclamation of disturbed sites as areas are altered and resources are depleted. These restrictions and requirements will help mitigate future habitat losses, although the full benefits from reclaimed sagebrush stands will not be realized for many years, possibly decades, after the reclamation or decommissioning phases of the projects. Habitat losses due to rural housing developments should be considered permanent. As with all lands administered on the TBNG, further consolidation of lands through land exchange will occur as opportunities arise.

Ongoing and previously permitted surface disturbance will continue in the analysis area regardless of whether or not the proposed project is approved. Therefore, precluding the project by selection of the No Action alternative would not eliminate additional short- or long-term effects on sage-grouse habitat, sage-grouse population viability, or the distribution of sage-grouse across the TBNG. However, the timely implementation of mitigation measures in suitable habitat on- and off-site within the TBNG, along with additional voluntary conservation measures being implemented by PPRM and adjacent mines as part of the ongoing CCAA/CCA development, will sufficiently reduce overall impacts to maintain a viable population within the planning area. More details regarding impacts on sage-grouse and their habitat are provided in the *Management Indicator Species* sections of this document.

### **Determination of Effects and Rationale for Sensitive Species**

The No Action alternative **may impact individuals but not likely to cause a trend to federal listing or loss of viability in the planning area** for 21 of the 22 evaluated Region 2 (TBNG) sensitive species.

#### **Sage-grouse**

The No Action alternative will not delay or decrease the magnitude of those impacts within the Geographic Area or elsewhere in the Grassland. Furthermore, due to the downward trend of sage-grouse populations throughout the TBNG, even this alternative could conflict with the current Grassland Plan or future objectives to manage the area for sage-grouse. However, in addition to USFS Standards and Guidelines for sage-grouse, PPRM's long-term involvement in the ongoing, voluntary development of a joint CCAA/CCA, in collaboration with the USFWS and federal land management agencies in northeast Wyoming, will ensure that conservation measures for sage-grouse will continue to be implemented on- and off-site to offset impacts from mining in suitable sage-grouse habitat. Therefore, the No Action alternative **may impact individuals but not likely to cause a trend to federal listing or loss of viability in the planning area.**

Without mitigation, the Proposed Action is likely to result in a trend to federal listing or loss of viability in the planning area for sage-grouse on the TBNG. Long-term telemetry data have documented that sage-grouse use limited portions of the analysis area, including lands near the proposed road corridor in some locations. Impacts such as increased levels of traffic, noise, dust, permanent infrastructure, human presence, and potential use of new travel corridors by mammalian predators will occur both during and after construction. These impacts will have both short- and long-term effects on sage-grouse habitat, sage-grouse population viability, and the distribution of sage-grouse across the TBNG.

However, the timely implementation of mitigation measures in suitable habitat on- and off-site within the TBNG, along with additional voluntary conservation measures being implemented by PPRM and adjacent mines as part of the ongoing CCAA/CCA development, will sufficiently reduce overall impacts to maintain a viable population within the planning area. Therefore, the Proposed Action **may impact individuals but not likely to cause a trend to federal listing or loss of viability in the planning area.**

### **Required Mitigation**

The following mitigation measures will be required under the Proposed Action. During road construction, PPRM will be required to mitigate on-site impacts through the use of dust suppression methods and materials, and to adhere to timing restrictions (i.e., USFS Standards) designed to protect active lek sites. Reclamation of newly disturbed areas beyond the final right-of-way will occur upon completion of construction, and will be accomplished using approved methods and seed mixes. The company may voluntarily choose to continue dust suppression for some time post-construction as a good faith effort.

PPRM also will be required to implement off-site mitigation measures in appropriate sage-grouse habitat elsewhere on the TBNG before, during, or after construction. Such measures could include, but are not limited to: cheatgrass treatments, weed control, conifer removal in sagebrush stands, shrub removal in drainages (i.e., brood-rearing habitat) through mowing, water development or enhancement in brood-rearing habitats, windmill removals in favor of solar power, or other measures identified collaboratively by PPRM and the USFS as beneficial to sage-grouse.

### **Monitoring**

Surveys for sensitive species will be conducted in the future, as determined necessary by the USFS, to monitor the effects of the project on populations.

### **3.4.3 Management Indicator Species (MIS)**

A Management Indicator Species (MIS) is defined as a “plant or animal species or habitat components selected in a planning process used to monitor the effects of planned management activities on populations of wildlife and fish, including those that are social or economically important” (USFS 2002). Management indicator species are selected to serve as barometers for species diversity and viability. These species are monitored over time to assess the effects

of management activities on their populations and habitat, and the populations of other species with similar habitat needs. The MIS for the TBNG are identified by Geographic Area.

The majority of the proposed project is within the Hilight Bill Geographic Area. Approximately 1.6 miles of the construction corridor will cross NFS lands in the Broken Hills Geographic Area; 1.2 miles along the central portion of the route and 0.4 mile near its southern extent. Disturbance in that geographic area will affect approximately 60.0 non-contiguous acres. As a result, the Mackey Road Relocation project has two MIS: the sage-grouse and black-tailed prairie dog (USFS 2002, Chapter 2). The sage-grouse is identified for both the geographic areas, whereas the prairie dog is selected only in the Broken Hills Geographic Area.

## **Existing Conditions**

### **Black-tailed Prairie Dog**

No black-tailed prairie dog colonies are present in the portions of the analysis area that overlap the Broken Hills Geographic Area: T42:R69, Section 21 and northeast Section 33. Therefore, no impacts to this MIS will occur in that geographic area. Consequently, the sage-grouse is the only MIS discussed for the remainder of this section. Refer to the previous sections of this document for descriptions of prairie dog occurrence in the project area and the potential impacts of the proposed project on this species.

### **Sage-grouse**

The sage-grouse is selected as a MIS for sagebrush habitats that have tall, dense, and diverse herbaceous understories (USFS 2002). This species generally does not respond positively to human activities and disturbances. The decline in sage-grouse populations across its range has been attributed, in part, to a loss in habitat or its function, and increased human disturbances during critical periods of its life cycle. These periods include breeding, nesting and, in some cases, during stressful times due to winter conditions (USFS 2002).

### **Management Direction**

The TBNG Grassland Plan identifies specific Objectives for the management of habitat for sage-grouse, as well as Standards and Guidelines to guide management activities on NFS lands. The Grassland-wide direction that applies to the Proposed Action (Mackey Road Relocation) is outlined in detail in Chapter 1 of the Plan, on pages 1-18 and 1-19 (Sage-grouse), 1-29 (Section P: Special Uses), and to 1-30 (Section Q: Infrastructure Use and Management). Objectives, Standards, and Guidelines for sage-grouse specific to the Broken Hills Geographic Areas can be found in Chapter 2 of the Grassland Plan (USFS 2002: pages 2-5 and 2-8). Such information for the Hilight Bill Geographic Area is found in Chapter 2, pages 2-23 and 2-24 (USFS 2002). All Objectives, Standards, and Guidelines applicable to the Mackey Road Relocation project are outlined in Appendix B of this document.

## Habitat

The USFS currently estimates that approximately 438,000 acres of potential sage-grouse habitat (sagebrush and grassland mixture) is currently available to grouse on the TBNG (USFS 2002, Appendix H). As stated, the majority of the Mackey Road Relocation project is within the Hilight Bill Geographic Area. More than half of that geographic area is considered potentially suitable sage-grouse habitat; some of those acres fall within the analysis area for the project. A smaller proportion of the Broken Hills Geographic Area is considered potentially suitable; that area is comprised primarily of rolling hills and steep escarpments, with a mix of upland grasslands, sagebrush stands, pine breaks, and prominent drainage systems. With the exception of those areas that have been disturbed as a part of coal mining operations, the USFS will consider all sagebrush stands within the analysis area as potentially suitable sage-grouse. Additional sage-grouse habitat can be found in small grassland openings, intermingled meadows, wetlands, and drainages next to sagebrush, where breeding and brood-rearing occur. It is assumed that the percentages of both moderately dense and dense sagebrush stands found on the TBNG and within the analysis area are relatively consistent with overall stand conditions throughout the Powder River Basin.

Results from the long-term annual monitoring and telemetry study have demonstrated that sage-grouse use of the project area has been concentrated in the central portion of the Mackey Road Relocation project area (i.e., construction corridor) and 4.0-mile analysis area since at least 2001. However, the quality of available sagebrush habitat varies widely throughout the area, ranging from heavily grazed, sparse sagebrush stands with little residual grasses to moderately dense stands of sagebrush intermingled with good quality residual grasses. Although some sagebrush is present, the western quarter of the analysis area is dominated by upland grassland communities, particularly in the southwestern corner. Consequently, the analysis area consists of both occupied and unoccupied habitat.

Existing land uses on both federal and non-federal lands in the analysis area include open pit coal mining, oil and gas (conventional and CBNG) developments, livestock grazing (both cattle and sheep), required annual wildlife monitoring and mitigation measures, and limited recreation. Oil and gas development and livestock grazing are currently the most prevalent land uses in the area, though the NARM coal pit is encroaching from the south and the SCM will encroach from the north. All of those activities are permitted, and are expected to continue in the future.

## Populations

### Project Area and Analysis Area

Two active sage-grouse leks are present within 4.0 miles of the project area: Payne and Tracy Waterhole (Appendix A, Exhibit C). Four inactive lek sites are also present in that analysis area: Rochelle, Wilson, Kort I, and Kort II. The USFS defines active leks as having attending males present during at least 1 of the most recent 5 years, whereas inactive leks have not had attending males present in the most recent 5-year period (USFS 2002, page 1-18). This is in contrast to the WGFD lek management status definitions, which extend out to a 10-year assessment period. Because the project affects NFS lands, the USFS definitions are used for

this analysis.

Peak male counts at both active leks have historically been low, with an average of approximately 7 males per year at the Payne lek and 15 males per year at the Tracy Waterhole lek since their respective discoveries. Peak male counts have declined at both sites over the last few years (pre-disturbance). As noted, all other leks in the analysis area are inactive by USFS classification.

Grouse were last documented at the Rochelle lek in 1999, and it was disturbed by mining activities in 2004. The Wilson and Kort leks were last active in 1997, 2004, and 2006, respectively. The Wilson and Kort II leks were disturbed by mine operations in 2011, and the Kort I lek was disturbed by mine activities in 2012. All mine related disturbance at and within 2.0 miles of these leks occurred during the non-breeding season to minimize potential impacts on breeding or nesting grouse. As stated, all four of these leks have been inactive for at least the last 5 years.

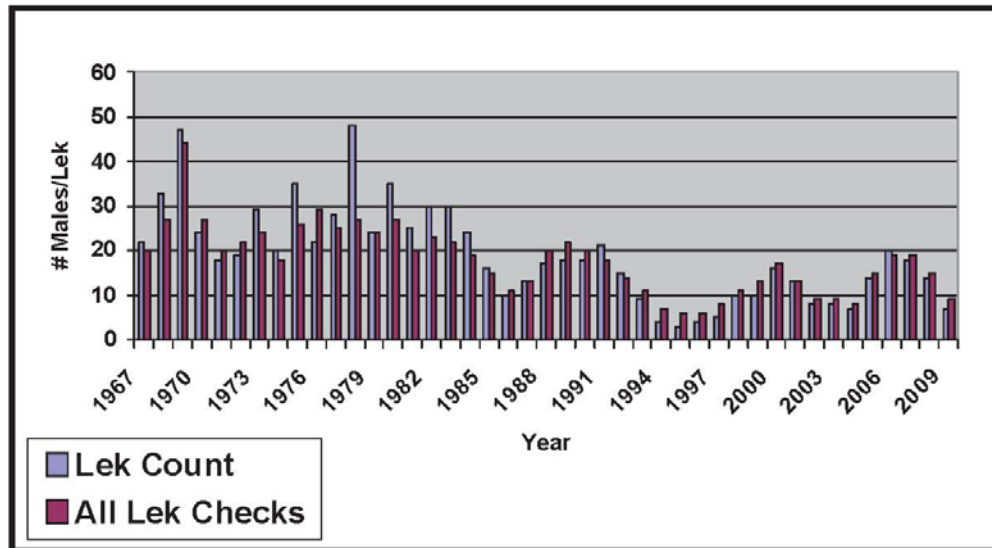
### **Grassland-wide and Geographic Area**

Sagebrush habitats in northeast Wyoming are less continuous than in the western part of the state, which contributes to lower sage-grouse densities in the northeast (WGFD 2009). Northeast Wyoming has the lowest average male lek attendance in the state, averaging 9 males per active lek in 2009 compared to the statewide average of 25 males per active lek that year; that is the most current compiled data available from the WGFD. Most leks in northeast Wyoming are small, with peak counts of less than 20 males. Less than 10% of those leks have peak counts greater than 50 males (WGFD 2009).

The average number of males/active lek for all monitoring (counts and surveys) combined from 1967 through 2009 (most current data available) for the Northeast Wyoming Working Group Area is shown in Figure 3-1 (WGFD 2009). Assuming the average number of males/active lek is reflective of the sage- grouse population, the trend suggests about a 10-year cycle of periodic highs and lows. With the exception of the most recent cycle, the trends show a concerning pattern of peaks and periodic lows in average male attendance usually being lower than the previous level in both cases. Consequently, the long term trend suggests a steadily declining sage-grouse population (WGFD 2009). Recent fluctuations, including periods of increase, in population trends are believed to be largely weather-related. Timely precipitation in some years resulted in improved habitat conditions, allowing greater numbers of sage-grouse to hatch and survive. Conversely, multi-year drought conditions are believed to have caused lower grouse survival in the early 2000s, leading to population declines during that period.

Figure 3-1. Northeast Wyoming Local Working Group Area males lek attendance from 1967 through 2012.





Northeast Wyoming Working Group 2008 Annual Sage-Grouse Completion Report (WGFD 2009, most current available through fall 2012)

Long-term trends for the number of males/active lek on the TBGN have been similar to the statewide and northeast Wyoming trends, though TBNG counts have been consistently lower than those in the other two regions (Figure 3-2). The statewide and regional patterns are important relative to the TBNG because the Grasslands are a part of these larger data sets.

In 2012 and early 2013, the USFS reevaluated sage-grouse viability on the TBNG. During the period from 1996 through 2012, the minimum sage-grouse population estimate has been highly variable but has shown a consistent downward trend since 2007 (Figure 3-3). The population estimate was below the 10-year mean from 2003 through 2005. After a brief rebound, it fell below the mean again in 2009 and has continued to decline in each subsequent year.

Figure 3-2. Mean number of males/lek counted at active sage-grouse leks for all of Wyoming, northeast Wyoming, and on the TBNG from 1996 through 2011.

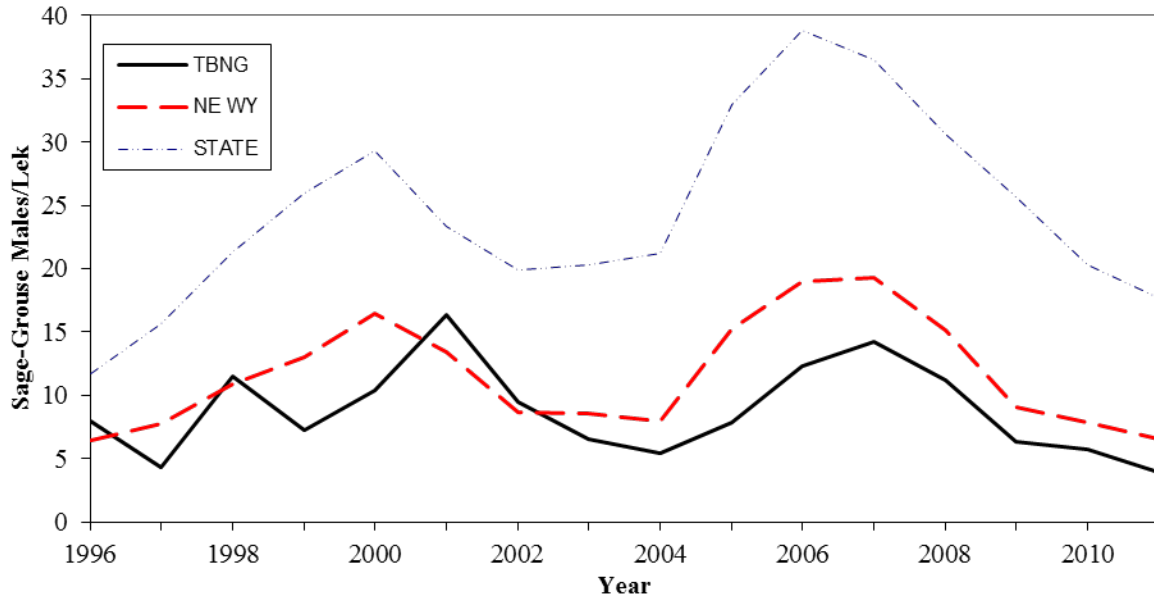
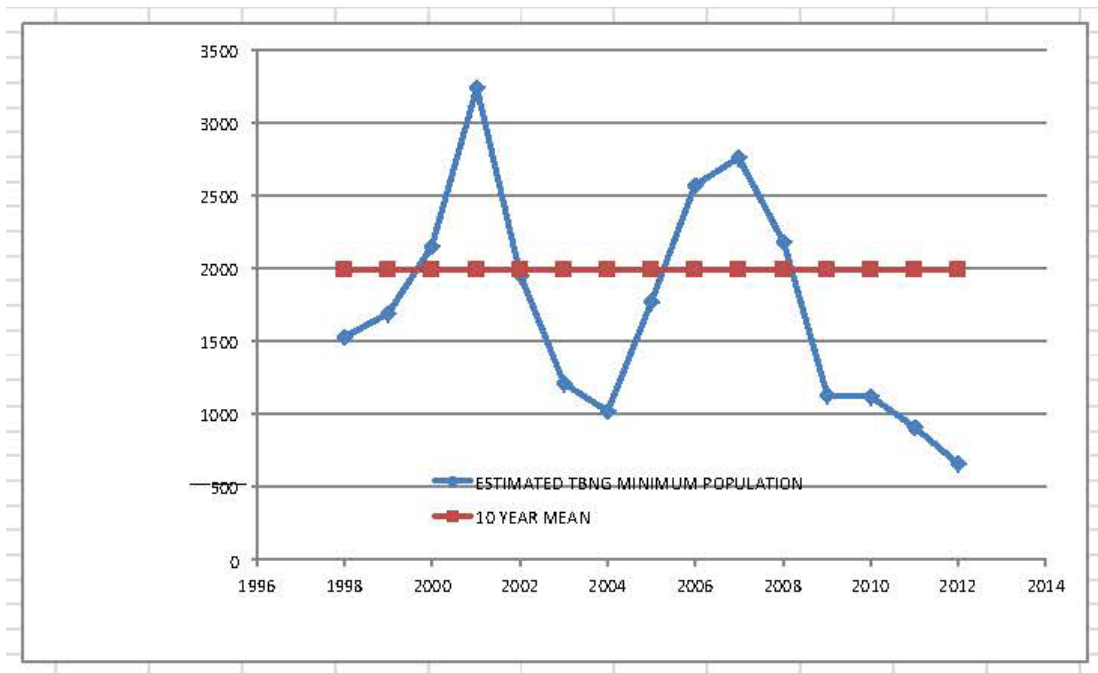


Figure 3-3. Minimum sage-grouse population estimates and 10-year mean for the TBNG from 1996 through 2012.



The declines in sage-grouse populations on the TBNG over time are likely related to a variety of factors, alone or in combination, such as: major shifts in land use; increased presence of invasive and weedy plant species and associated changes in fire regime; increased presence of vertical structures such as utility, wind power, and communication infrastructure; increased habitat loss from rural subdivision; and natural causes such as drought and wildfire that have

combined to result in the loss, fragmentation, or degradation of sagebrush habitats that have compromised the large blocks of habitat necessary to sustain this sage-grouse.

### **Hilight Bill and Broken Hills Geographic Areas**

As stated, the majority of the Mackey Road Relocation project is within the Hilight Bill Geographic Area. More than half of that geographic area is considered potentially suitable sage-grouse habitat; some of those acres fall within the analysis area for the project. A smaller proportion of the Broken Hills Geographic Area is considered potentially suitable; that area is comprised primarily of rolling hills and steep escarpments, with a mix of upland grasslands, sagebrush stands, pine breaks, and prominent drainage systems. With the exception of those areas that have been disturbed as a part of coal mining operations, the USFS will consider all sagebrush stands within the analysis area as potentially suitable sage-grouse. Additional sage-grouse habitat can be found in small grassland openings, intermingled meadows, wetlands, and drainages next to sagebrush, where breeding and brood-rearing occur. It is assumed that the percentages of both moderately dense and dense sagebrush stands found on the TBNG and within the analysis area are relatively consistent with overall stand conditions throughout the Powder River Basin.

Only six sage-grouse leks have been documented on NFS lands within the entire Hilight Bill Geographic Area. Four of those leks are classified as abandoned or destroyed due to activity associated with local surface coal mines. The average number of male grouse per lek from 2008 through 2011 was lower than in all previous years (Figure 3-4). This declining trend has occurred since before 2002. However, it is worth noting that counts rarely exceeded five males per lek during that period, indicating that this geographic area may not be a stronghold for grouse; that likelihood has also been acknowledged by the WGFD (2009). In 2009, two leks were still considered active on NFS lands in this Geographic Area.

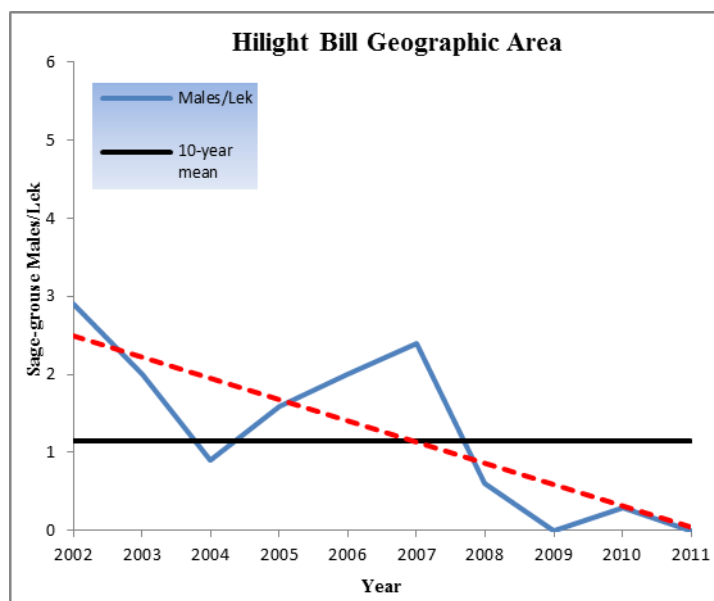
## **Environmental Consequences (Effects Analysis)**

### **Alternative 1: No Action**

#### **Direct and Indirect Effects on Habitat in the Project Area**

Under the No Action alternative, the existing alignments of the Mackey County Road and the directly adjoining segment of the Temporary Reno Road will be retained, and no new road construction will occur. Mining will not occur under the approximately 6.1 miles of the existing Mackey County Road and 2.2 miles of existing Temporary Reno Road within the NARM permit area.

Figure 3-4. Sage-grouse males per lek and 10-year mean for the Hilight Bill Geographic Area from 2002 through 2011.



Only two of the six leks within the 4.0-mile analysis area are still active. Five of the six lek sites are within the existing permit area for one or more mines and, therefore, are already subject to mine related disturbance regardless of actions taken on this proposal. Four of those five sites have already been eclipsed by mine operations and disturbance at the fifth lek is imminent, even under the No Action alternative. The active Tracy Waterhole lek is on private surface, and is the only one of the six leks in the analysis area that is located beyond a current mine permit boundary. However, this lek is currently exposed to regular disturbance from road traffic on a scoria oil field road located within 100 yards and in view of the lek. Per USFS standards, surface disturbance on NFS lands within 2.0 miles of active leks occurs only during the non-breeding season, regardless of whether or not the lek itself is on NFS lands.

Due to the presence of existing disturbance near the Tracy Waterhole lek, implementation of the No Action alternative will not preclude additional short- or long-term effects on individuals or suitable habitat (occupied and unoccupied) in that area. The No Action alternative also will not delay or decrease the magnitude of those impacts within the Geographic Area or elsewhere in the Grassland. Furthermore, due to the downward trend of sage-grouse populations throughout the TBNG, even this alternative could conflict with the current Grassland Plan or future objectives to manage the area for sage-grouse. However, in addition to USFS Standards and Guidelines for sage-grouse, PPRM's long-term involvement in the ongoing, voluntary development of a joint Candidate Conservation Agreement with Assurances/Candidate Conservation Agreement (CCAA/CCA) in collaboration with the USFWS and federal land management agencies in northeast Wyoming will ensure that conservation measures for sage-grouse will continue to be implemented on- and off-site to

offset impacts from mining in suitable sage-grouse habitat. Those voluntary measures were first initiated in 2006, and are ongoing; adjacent mines also are participating in this program. More details regarding impacts on sage-grouse and their habitat are provided in the *Sensitive Species* and *Management Indicator Species* sections of this document.

### **Alternative 2: Proposed Action**

The Proposed Action will result in approximately 292.7 acres of short-term surface disturbance on NFS lands during construction, and approximately 85.7 acres of permanent disturbance upon completion and transfer of the road easement to Campbell County.

No grouse leks will be physically disturbed under the Proposed Action, either on or off NFS lands. The Tracy Waterhole lek is the nearest active lek to proposed disturbance. That lek is currently exposed to periodic oil and gas traffic on the scoria road approximately 100 yards west of the lek. The proposed construction corridor (project area) is approximately 0.75 mile west and beyond view of the Tracy Waterhole lek, which is beyond the USFS surface occupancy buffer distance (0.25 mile). The active Payne lek is approximately 3.8 miles west and beyond view of the project area. That lek is currently exposed to existing oil production, road traffic, and encroaching mine operations. Per USFS standards, surface disturbance on NFS lands within 2.0 miles of active leks occurs only during the non-breeding season, regardless of whether or not the lek itself is on NFS lands.

Despite these considerations, grouse habitat will be affected under the Proposed Action. As noted, the project will disturb approximately 292.7 short-term acres (i.e., during construction) and 85.7 long-term acres (new infrastructure and post-construction maintenance) on NFS lands. The latter total will be within the final 100-foot right-of-way for the relocated road. Much of the disturbance corridor will follow or be near existing roads and two-tracks, though the new right-of-way corridor will be considerably wider than current road conditions and designed to accommodate two-way traffic when finished. Suitable sage-grouse habitat does not occur along the entire length of the proposed construction corridor. However, construction activities and post-construction use of the relocated road will result in altered and/or fragmented sage-grouse habitats either not currently subject to such disturbance or not currently exposed to traffic levels expected to occur upon completion of the project. The introduction of invasive and/or weedy plant species is also possible as equipment and other vehicles enter the project area during construction, operation, or maintenance of the new road. Increased levels of dust also are likely to result from the project, both during and after construction.

The timing of the project during the non-breeding season will minimize potential impacts on sage-grouse and their habitats during construction, but will not alleviate impacts, especially long-term impacts associated with the final right-of-way. Descriptions of required mitigation measures to offset impacts to sage-grouse are provided under *Required Mitigation*, below. Timely implementation of these measures in suitable habitat on- and off-site within the TBNG, along with additional voluntary conservation measures being implemented by PPRM and adjacent mines as part of the ongoing CCAA/CCA development, will sufficiently reduce overall impacts to maintain a viable population within the planning area. Additional details

regarding potential impacts under the Proposed Action are described in the *Sensitive Species* and *Management Indicator Species* sections of this document.

### **Direct and Indirect Effects on Individuals in the Project Area**

Direct loss of, or injury to, individual sage-grouse residing within the project area could result from vehicle collisions from equipment associated with road construction or post-construction use by the general public. Additional direct effects could result from collision with new fence lines that might be built in previously undisturbed flight paths and/or use of new travel corridors by mammalian predators. In addition to increased vehicular traffic and noise, greater public access to NFS lands post-construction will likely lead to an increase in year-round recreational activities such as hiking and hunting that could be disruptive to any sage-grouse nesting or foraging in the area.

### **Direct and Indirect Effects and Cumulative Impacts on Habitat Trends Grassland-wide**

As noted under the previous discussions, the analysis area encompasses both occupied and unoccupied sage-grouse habitat. While impacts can and have occurred in many places across the TBNG, some areas continue to provide suitable, occupied sage-grouse habitat that serves the region as a whole. Nevertheless, cumulative impacts are expected to cause a direct loss or degradation of seasonal or year-round sage-grouse habitats, including long-term impacts in all habitat types found within existing and pending mine permit boundaries. Ongoing and previously permitted surface disturbance will continue in the analysis area regardless of whether or not the proposed project is approved. Disturbances such as pipelines, power lines, roads, and other infrastructure tend to fragment or reduce the effectiveness of remaining habitats within the vicinity of development. New fence construction, introduction of invasive and/or weedy plant species, and/or changes in fire regimes often accompanies these types of development. The additional and synergistic impacts from other factors including, but not limited to, drought, grazing, off-road vehicle use, and other forms of recreation also continue to adversely impact year-round sage-grouse habitat, especially sagebrush stands and nearby aquatic habitats (potential brood rearing habitat).

### **Direct and Indirect Effects and Cumulative Impacts on Population Trends Grassland-wide**

Long-term trends for the number of males/active lek on the TBGN have been similar to the statewide and northeast Wyoming trends, though TBNG counts have been consistently lower than those in the other two regions (Figure 3-2). The declines in sage-grouse populations on the TBNG over time are likely related to a variety of factors, alone or in combination, such as: major shifts in land use; increased presence of invasive and weedy plant species and associated changes in fire regime; increased presence of vertical structures such as utility, wind power, and communication infrastructure; increased habitat loss from rural subdivision; and natural causes such as drought and wildfire that have combined to result in the loss, fragmentation, or degradation of sagebrush habitats that have compromised the large blocks of habitat necessary to sustain this sage-grouse.

### **Summary of Effects on Grassland-wide Habitat and Population Trends as it Relates to Viability**

The Hilight Bill Geographic Area (including the Mackey Road Relocation project area) represents approximately 4% of the sage-grouse population for the TBNG, and 17% of the potential sage-grouse habitat. Sage-grouse continue to remain well-distributed across the TBNG, occurring in all six Geographic Areas; the majority (96%) of the population resides outside the Hilight Bill Geographic Area. However, populations are in decline throughout the TBNG, and habitat fragmentation, loss, or degradation is likely to continue or increase in the near future. The additional and synergistic impacts from other factors including, but not limited to, drought, disease, grazing, off-road vehicle use, and other forms of recreation also continue to adversely impact year-round sage-grouse habitat, especially sagebrush stands and nearby aquatic habitats (potential brood rearing habitat).

Without mitigation, the Proposed Action is likely to result in a trend to federal listing or loss of viability in the planning area for sage-grouse on the TBNG. Long-term telemetry data have documented that sage-grouse use limited portions of the analysis area, including lands near the proposed road corridor in some locations. Impacts such as increased levels of traffic, noise, dust, permanent infrastructure, human presence, and potential use of new travel corridors by mammalian predators will occur both during and after construction. These impacts will have both short- and long-term effects on sage-grouse habitat, sage-grouse population viability, and the distribution of sage-grouse across the TBNG.

Per USFS standards, surface disturbance on NFS lands within 2.0 miles of active leks occurs only during the non-breeding season, regardless of whether or not the lek itself is on NFS lands. Energy extraction activities have requirements for reclamation of disturbed sites as areas are altered and resources are depleted. These restrictions and requirements will help mitigate future habitat losses, although the full benefits from reclaimed sagebrush stands will not be realized for many years, possibly decades, after the reclamation or decommissioning phases of the projects.

The timing of the project during the non-breeding season will minimize potential impacts on sage-grouse and their habitats during construction, but will not alleviate impacts, especially long-term impacts associated with the final right-of-way. Descriptions of required mitigation measures to offset impacts to sage-grouse are provided under *Required Mitigation*, below. Timely implementation of these measures in suitable habitat on- and off-site within the TBNG, along with additional voluntary conservation measures being implemented by PPRM and adjacent mines as part of the ongoing CCAA/CCA development, will sufficiently reduce overall impacts to maintain a viable population within the planning area.

### **Determination of Effects and Rationale for MIS**

The Proposed Action and No Action alternative **may impact individuals but not likely to cause a trend to federal listing or loss of viability in the planning area** for black-tailed prairie dogs in the Broken Hills Geographic Area.

### **Sage-grouse**

The No Action alternative will not delay or decrease the magnitude of those impacts within the Geographic Area or elsewhere in the Grassland. Furthermore, due to the downward trend of sage-grouse populations throughout the TBNG, even this alternative could conflict with the current Grassland Plan or future objectives to manage the area for sage-grouse. However, in addition to USFS Standards and Guidelines for sage-grouse, PPRM's long-term involvement in the ongoing, voluntary development of a joint CCAA/CCA, in collaboration with the USFWS and federal land management agencies in northeast Wyoming, will ensure that conservation measures for sage-grouse will continue to be implemented on- and off-site to offset impacts from mining in suitable sage-grouse habitat. Therefore, the No Action alternative **may impact individuals but not likely to cause a trend to federal listing or loss of viability in the planning area.**

Without mitigation, the Proposed Action is likely to result in a trend to federal listing or loss of viability in the planning area for sage-grouse on the TBNG. Long-term telemetry data have documented that sage-grouse use limited portions of the analysis area, including lands near the proposed road corridor in some locations. Impacts such as increased levels of traffic, noise, dust, permanent infrastructure, human presence, and potential use of new travel corridors by mammalian predators will occur both during and after construction. These impacts will have both short- and long-term effects on sage-grouse habitat, sage-grouse population viability, and the distribution of sage-grouse across the TBNG.

However, the timely implementation of mitigation measures in suitable habitat on- and off-site within the TBNG, along with additional voluntary conservation measures being implemented by PPRM and adjacent mines as part of the ongoing CCAA/CCA development, will sufficiently reduce overall impacts to maintain a viable population within the planning area. Therefore, the Proposed Action **will not contribute to ability to maintain viable populations across the planning unit with required mitigation.**

### **Required Mitigation**

The following mitigation measures will be required under the Proposed Action. During road construction, PPRM will be required to mitigate on-site impacts through the use of dust suppression methods and materials, and to adhere to timing restrictions (i.e., USFS Standards) designed to protect active lek sites. Reclamation of newly disturbed areas beyond the final right-of-way will occur upon completion of construction, and will be accomplished using approved methods and seed mixes. The company may voluntarily choose to continue dust suppression for some time post-construction as a good faith effort.

PPRM also will be required to implement off-site mitigation measures in appropriate sage-grouse habitat elsewhere on the TBNG before, during, or after construction. Such measures could include, but are not limited to: cheatgrass treatments, weed control, conifer removal in sagebrush stands, shrub removal in drainages (i.e., brood-rearing habitat) through mowing, water development or enhancement in brood-rearing habitats, windmill removals in favor of



solar power, or other measures identified collaboratively by PPRM and the USFS as beneficial to sage-grouse.

### 3.4.4 Other Wildlife Species and Habitat Considerations

General descriptions of other species known to or potentially occurring in the project area are provided below. More detailed information regarding these species is available in the Annual Wildlife Monitoring Reports for NARM and in the Wright Area Coal LBA Final EIS. Annual wildlife reports for NARM are on file with the Douglas Ranger District and WDEQ in Sheridan and Cheyenne, Wyoming. The final EIS is available from the BLM's High Plains District Office in Casper, Wyoming.

#### Raptors

Potential impacts on the following sensitive raptor species were addressed in the Biological Evaluation section of this document: bald eagle, ferruginous hawk, burrowing owl, and northern harrier. Additional raptor species identified within the 1.0-mile analysis area are the golden eagle (*Aquila chrysaetos*), red-tailed hawk (*Buteo jamaicensis*), Swainson's hawk (*Buteo swainsoni*), great horned owl (*Bubo virginianus*), merlin (*Falco columbarius*), and long-eared owl (*Asio otus*).

Overall, 31 raptor nest sites representing six different species have been identified in the project area and the 1.0-mile analysis area during overlapping raptor monitoring at nearby surface coal mines over the last 3 to 20+ years (2010-2012 or 1984-2012, respectively), depending on the area. Over time, many of the nests in the survey area have been destroyed by natural causes, relocated for mine-related mitigation measures, or removed by mining. As of August 2012, 16 nests were known to be physically intact. Details regarding the location, nest substrate, and 7-year history of all 31 nest sites are provided in Appendix E in this document. Additional information is also available in the Annual Wildlife Monitoring Reports for NARM and adjacent mines. The latter reports are on file with the USFS Douglas Ranger District in Douglas, Wyoming and WDEQ in Sheridan or Cheyenne, Wyoming.

All 31 nest sites are located outside the current coal lease area (i.e., subject to USFS regulation). Fifteen nest sites are on NFS lands; 7 of the 15 nests are physically intact. Only 3 of the 15 nests on NFS lands are designated as "active" according to USFS guidelines.

Nine of the remaining 16 raptor nest sites off NFS lands were physically intact through August 2012. Five of the 16 sites are considered active: 4 intact nests and 1 former nest site. No active nest sites on private land are within a USFS standard buffer distance. No USFS standards or guidelines are applied to inactive nest sites regardless of surface ownership.

#### Bats

Two of the three sensitive bat species analyzed for this project have been documented in the Mackey Road Relocation analysis area: the hoary bat and fringed myotis. The Townsend's big-eared bat has not been recorded in that area.

Potential roosting habitat primarily occurs where pine breaks are present, mostly on ridgelines beyond the 300- to 700-foot construction corridor. Potential foraging areas occur primarily

over small reaches of intermittent or semi-perennial creek channels at the northern extent of the proposed disturbance corridor and isolated small ponds elsewhere within the project area, though bats also could forage among trees or over upland habitats near roosting habitat. Most creek channels and ponds in the area are often dry except during spring or immediately following a heavier precipitation event.

### **Migratory Bird Species of Management Concern in Wyoming**

In May 2002, the USFWS Ecological Services office in Cheyenne, Wyoming released a revised list of 77 Migratory Bird Species of Management Concern in Wyoming; that list was current through 2012. Twenty-two of those 77 species are considered as Level I, which indicates a clear need for conservation action. Those same 22 species should also be evaluated for projects on NFS lands (Table 6).

Nine of the 22 Level I species were discussed in the Biological Evaluation of Region 2 sensitive species. The sage-grouse is also a MIS for the proposed project. Three other Level I avian species of concern are also Region 2 sensitive species: sage sparrow (*Amphispiza belli*), northern goshawk (*Accipiter gentiles*), and black tern (*Chlidonias niger*). These three species were considered in the Biological Evaluation but were not selected due to their limited potential for occurrence in the project area resulting from the absence or paucity of appropriate habitat, or the lack of physical disturbance in appropriate habitat for those species.

Of the 10 remaining Level I species not already addressed, 6 are associated with open water or larger wetland habitats: the trumpeter swan (*Cygnus buccinators*), Franklin's gull (*Larus pipixcan*), Forster's tern (*Sterna forsteri*), whooping crane (*Grus Americana*), piping plover (*Charadrius melodus*), and Wilson's phalarope (*Phalaropus tricolor*). Wetland-type habitat is limited to 6.6 non-contiguous acres that dominated by grassland species and are often seasonally dry; open water is limited to approximately 0.23 acre where School Creek passes through the project area.

Upland sandpipers (*Bartramia longicauda*) prefer to forage and nest within homogenous grassland habitats, which are not prevalent within the majority of the project area and immediate vicinity; potential impacts on grassland species were thoroughly described in the above Biological Evaluation section of this document. The Baird's sparrow (*Ammodramus bairdii*) is a short-grass prairie species. Although both of these species have been documented in southern Campbell County and on the TBNG, neither has been observed in the Mackey Road Relocation project area during targeted surveys or incidental to those conducted in overlapping areas for nearby coal mines.

The remaining two Level I species are raptors. Swainson's hawks have historically nested in the 1.0-mile analysis area. Three territories have been identified over time, though only one has been active in the last 7 years. The SH22 nest was last active in 2007; this nest will not be affected by the proposed project, as it is located at the western edge of the 1.0-mile analysis area, well beyond the USFS buffer distances for this species. Furthermore, the project will occur during the non-breeding season when Swainson's hawks are either migrating out of, or have already left, the region.

No short-eared owl (*Asio flammeus*) nests have ever been detected in the analysis area, though individual adults have occasionally been seen there during spring or fall. All sightings were presumed to be migrant birds passing through the area, as no defensive behavior indicating nesting activities was ever observed.

Numerous ongoing activities are present in the analysis area, as well as in both the Hilight Bill and Broken Hills Geographic Areas. Those activities include, but are not limited to, coal mining, conventional oil and gas production, road use, livestock grazing, and various forms of recreation (hunting, trapping, hiking, etc.). Most of those activities are expected to continue at similar levels, though the type of activities may differ between the two geographic areas. Coal mining, and oil and gas development is expected to occur at an increased rate in the future due to the growing need for domestic energy sources in the United States.

### **Waterfowl and Shorebirds**

The project area and 1,000-foot (500 feet either side of center) analysis area for the Mackey Road Relocation project are comprised primarily of uplands, with limited occurrences of open water or wetlands. Drainages in that area generally consist of vegetated, dry, ephemeral tributaries to School Creek that lack wetlands or ordinary high water marks. Small, isolated depressional areas occur within portions of some drainages, supporting short duration ponding and seasonal wetlands. A total of 6.64 non-contiguous acres of wetlands were delineated in the Mackey Road Amendment project area during 2011 and 2012, with approximately 3.99 non-contiguous acres on NFS lands. The project area crosses School Creek (semi-perennial) and Little Thunder Creek (intermittent) at the northern end of the corridor; only the School Creek crossing will be on NFS lands. A few small stock reservoirs are also present in the surrounding area that could provide limited, short-term habitat for resident or migrating waterfowl and shorebirds, but they are typically only wet during spring. Wetland delineation reports for the Mackey Road Relocation project are on file with US Army Corps of Engineers.

Waterfowl and shorebird observations have consisted of relatively low numbers of common species, often restricted to spring migration. No broods have been recorded in the area due to limited and unreliable water resources in the area. Species most often observed were the mallard (*Anas platyrhynchos*), killdeer (*Charadrius vociferus*), and red-winged blackbird (*Agelaius phoeniceus*).

The majority of surface disturbance will occur in upland habitats, and vehicular traffic will use existing roads and two-tracks to access the project area, especially where stream crossings are necessary. The Proposed Action will disturb approximately 3.99 non-contiguous acres of potentially jurisdictional wetlands and the stream crossing for School Creek on NFS lands. However, such impacts will be reduced by implementing the project during the dry season (August through January), the use of appropriate erosion control measures during construction, the installation of appropriate culverts to maintain post-construction stream flow at the crossing, and by the requirement to mitigate any jurisdictional wetlands that may be lost to the project; determinations of jurisdictional wetlands are made by the U.S. Army Corps of Engineers. Given the limited and non-contiguous nature of potential impacts, the mobility of potentially affected wildlife species, and the availability of other suitable habitat outside the narrow construction corridor, the proposed project is not expected to have any long-term

effects on waterfowl or shorebirds using the area.

### **Amphibians, Reptiles and Fisheries**

The northern leopard frog and two sensitive fish species could occur in aquatic habitats within the project area, though impacts on NFS lands would be limited to the new School Creek crossing; the Little Thunder Creek crossing to be reconstructed is on private lands. These three aquatic species occur in low densities in the analysis area, if at all (Table 3-3). If present, these species could be impacted by the replacement or installation of culverts at creek crossings and/or runoff and sedimentation from construction and maintenance activities near the creeks. Improper installation of culverts could negatively affect frog habitat and/or fish passage at creek crossings. Disruption of groundwater flow into School Creek from the nearby clinker aquifer also could occur. Wetlands and other riparian areas that could potentially support frogs also could be negatively affected by construction and maintenance activities through sedimentation.

Such impacts will be minimized by the timing (during low flow) of road construction, the use of appropriate erosion control measures, and the installation of culverts designed to maintain post-construction habitat connectivity and prevent down-cutting and head-cutting within the stream channels. Upon completion of the project, all road cuts, fill slopes, topsoil stockpiles, and other areas disturbed outside the permanent right-of-way as a result of this project will be reclaimed using approved techniques and seed mixes.

### **Big Game**

The only three big game species common throughout the analysis area (right-of-way and 1.0-mile perimeter) are the pronghorn, mule deer and elk. No crucial or critical big game ranges or migration corridors occur in or within several miles of the analysis area.

Pronghorn are the most common big game species within the analysis area, but are not abundant. This species is most often seen in sagebrush shrubland or mixed-grass prairie habitats in the general project area. The project area is within the Cheyenne River Pronghorn Herd Unit. The WGFD has classified the analysis area as winter/yearlong pronghorn range (i.e., a population or a portion of a population of animals make general use of this habitat on a year-round basis, with a significant influx of additional animals onto this habitat from other seasonal ranges in the winter). Results from regular surveys conducted in the overlapping NARM monitoring area from 1987 through 2012 have yielded an average of 4.5 pronghorn per square mile.

Mule deer are frequently observed in native and reclaimed habitats within existing surface coal mines west of the project area. In certain areas of the state, this species tends to be more migratory than white-tailed deer, traveling from higher elevations in the summer to winter ranges that provide more food and cover. However, general monitoring has indicated that mule deer are not migratory in the vicinity of the analysis area. The project area is within the Cheyenne River Mule Deer Herd Unit. That area has been classified by the WGFD as being yearlong mule deer use range. Long-term winter ground surveys conducted at NARM have yielded an average of 96 animals per survey, or 0.6 mule deer per square mile.

The project area is within the Rochelle Hills Elk Herd Unit, in year-long range. Not surprisingly, elk are year-round residents in the area, though most sightings occur in the pine breaks along the eastern portion of the analysis area. Elk also may calve in the analysis area; again, the exposed location of the project area itself makes it unlikely that calving elk would use that specific area.

White-tailed deer are transients in southern Campbell County, but are most often seen in cottonwood corridors along primary creek drainages; little such habitat is present within the analysis area.

Because the entire project area is beyond the permit area of the NARM, public access and hunting are allowed in portions the project area.

### **Other Mammals**

A variety of small and medium-sized mammal species occur in the vicinity of the Mackey Road Relocation analysis area, although most have not been observed in the project area itself. These species include predators and furbearers including, but not limited to, the coyote, red fox (*Vulpes vulpes*), striped skunk (*Mephitis mephitis*), long-tailed weasel (*Mustela frenata*), and badger (*Taxidea taxus*). Prey species include jackrabbits (*Lepus* spp.) and cottontails (*Sylvilagus* spp.), as well as various rodents, mice, voles, gophers, ground squirrels, chipmunks, and black-tailed prairie dogs. Most prey species are cyclically common and widespread throughout the region, and are important for raptors and other predators.

### **Sharp-tailed Grouse**

In Wyoming, the plains sharp-tail grouse is locally common where grasslands are intermixed with other shrublands, especially in wooded draws, shrubby riparian areas, and wet meadows (Orabona et al. 2012). Sharp-tailed grouse are more commonly found in the northern portion of the TBNG in mixed-grass environments. The nearest known sharp-tailed grouse lek (Timber Creek) is approximately 39 miles to the north of the project area.

## **Environmental Consequences (Effects Analysis)**

### **Alternative 1: No Action**

Under the No Action alternative, the existing alignments of the Mackey County Road and the directly adjoining segment of the Temporary Reno Road will be retained, and no new road construction will occur. Mining will not occur under the approximately 6.1 miles of the existing Mackey County Road and 2.2 miles of existing Temporary Reno Road within the NARM permit area.

Most of the species evaluated have either not been documented in the analysis area, or occur seasonally or infrequently. Any species present are currently subject to injury or loss due to predation (avian and/or mammalian), collision with vehicles on existing roads, and/or current recreational shooting of prairie dogs in limited portions of the analysis area. As those impacts are already present, selection of the No Action alternative would not reduce or eliminate existing risks to these species.

## **Alternative 2: Proposed Action**

### **Raptors**

None of the three active nest sites on NFS land are within a stated buffer distance for surface occupancy or timing of activities according to USFS standards. One of those three nests (SH8b/GHO4/RTH9b-BT) has been used by multiple species over time, but red-tailed hawks have been the only species using the site in the last 7 years. Consequently, buffers associated with that species were applied to this site. Because all active nest sites are beyond the required buffer distances, no USFS standards will apply. Additionally, construction activities will not begin before August 2014 and will last approximately 5 months (through January 2015); therefore, the project will be completed prior to the 2015 nesting season.

Potential but unoccupied nesting habitat is present in trees and rough breaks spread throughout the analysis area. Trees occur as cottonwoods along School Creek and pines on scoria ridgelines. Few, if any, trees will be physically impacted by the proposed project.

The above actions and adherence to the species-specific standards and guidelines (Appendix B) will assure that the quality of known raptor nest sites will not be degraded by the Proposed Action. Annual monitoring of known raptor nests within the area may be recommended to document occupancy. The proposed project will not conflict with the Grassland Plan (USFS 2002), or any future objectives to manage the area for raptor species.

### **Bats**

The proposed project will have little, if any, physical impact on known bat roost sites, maternity sites, or other concentrated use sites, as few, if any, trees will be removed during construction. Potential roosting habitat primarily occurs where pine breaks are present, mostly on ridgelines beyond the 300- to 700-foot construction corridor. Though trees may not be physically removed, the proximity of the new road could impact potential roosting habitats in some locations. Potential foraging areas occur primarily over small reaches of intermittent or semi-perennial creek channels at the northern extent of the proposed disturbance corridor and isolated small ponds elsewhere within the project area, though bats also could forage among trees or over upland habitats near roosting habitat. Most creek channels and ponds in the area are often dry except during spring or immediately following a heavier precipitation event. Disturbances in open water habitats will consist of replacing or constructing creek crossings and widening or building the road at those locations.

Construction will occur during daylight hours and in the fall/winter months, when bat species are inactive or absent from the area. The timing of the project during the fall/winter months, limited physical impacts to potential maternity sites, spring/summer roosting areas, and foraging areas, will minimize potential impacts on bats and their habitats during construction. However, these factors will not alleviate potential long-term impacts of increased traffic associated with the final right-of-way. Including shrubs and trees in reclamation of disturbed riparian areas will help replace potential foraging and long-term roosting habitat.

The above actions and adherence to any relevant species-specific Standards and Guidelines would assure that the quality of potential bat roosting sites would not be degraded by the Proposed Action. Given the distance between the construction area and the nearest potential roosting habitat, the timing and nature of the project, and the minimal long-term habitat disturbance that would result, direct and indirect impacts to bats would be minimal, if they occurred at all. Additional impacts from the project and associated activities are not expected to increase the cumulative impacts to a point that could negatively impact bat populations. The proposed project would not conflict with the Grassland Plan (USFS 2002), or any future objectives to manage the area for bat species.

### **Migratory Bird Species of Management Concern**

The Proposed Action, in combination with other operations near the project area, could potentially impact individual species of concern discussed in this section. However, due to the absence of most species in the project area during the construction period (August 2013 through January 2014) and the proximity of current disturbance activities, the Proposed Action is not expected to increase the potential cumulative impacts to a point that will negatively impact populations of any species discussed in this document. Additionally, the proposed project will not conflict with the Grassland Plan (USFS 2002), or any future objectives to manage the area and provide habitat for migratory birds.

### **Aquatic-related Species (Waterfowl, Shorebirds, Amphibians, and Fish)**

Impacts on NFS lands would be limited to the new School Creek crossing; the Little Thunder Creek crossing to be reconstructed is on private lands. Aquatic species occur in low densities in the analysis area, if at all. If present, these species could be impacted by the replacement or installation of culverts at creek crossings and/or runoff and sedimentation from construction and maintenance activities near the creeks. Improper installation of culverts could negatively affect frog habitat and/or fish passage at creek crossings. Disruption of groundwater flow into School Creek from the nearby clinker aquifer also could occur. Wetlands and other riparian areas also could be negatively affected by construction and maintenance activities through sedimentation.

Such impacts will be minimized by the timing (during low flow) of road construction, the use of appropriate erosion control measures, and the installation of culverts designed to maintain post-construction habitat connectivity and prevent down-cutting and head-cutting within the stream channels. Servicing and refueling equipment and vehicles away from streams and riparian areas, and staging equipment at least 300 feet from those areas, will further reduce the potential for contamination of aquatic resources. Washing equipment brought in from outside location prior to use will help reduce the potential spread of invasive or weedy species into the project area. Upon completion of the project, all road cuts, fill slopes, topsoil stockpiles, and other areas disturbed outside the permanent right-of-way as a result of this project will be reclaimed using approved techniques and seed mixes.

## **Big Game**

As noted, the project will disturb approximately 292.7 short-term acres (i.e., during construction) and 85.7 long-term acres (new infrastructure and post-construction maintenance) on NFS lands. The latter total will be within the final 100-foot right-of-way for the relocated road. Construction activities and post-construction use of the relocated road will result in altered and/or fragmented habitats either not currently subject to such disturbance or not currently exposed to traffic levels expected to occur upon completion of the project. The introduction of invasive and/or weedy plant species is also possible as equipment and other vehicles enter the project area during construction, operation, or maintenance of the new road. Increased levels of dust and noise also are likely to result from the project, both during and after construction. In addition to increased vehicular traffic, greater public access to NFS lands post-construction will likely lead to an increase in year-round recreational activities such as hiking and hunting that could be disruptive to any animals foraging or raising young in the area and cause animals to avoid the construction area and/or shift their normal habitat use.

The timing of the project during the non-breeding season will minimize potential impacts on big game and their habitats during construction, but will not alleviate impacts, especially long-term impacts associated with the final right-of-way. Descriptions of required mitigation measures to offset impacts to sage-grouse will also benefit other wildlife species; other mitigation measures might also be appropriate, both for big game and to mitigate losses of secluded public lands for hunters and other recreationists. The use of wildlife-friendly fencing will facilitate passage of big game animals through the project area once construction is complete. Game crossing signs and reduced speed limits through the most likely elk habitat (i.e., areas nearest timber) will help reduce the potential for injuries or mortalities due to vehicle collisions. The use of unpalatable, cool season grasses during reclamation along the right-of-way itself could minimize the enticement of big game and other wildlife into the travel corridor, further reducing potential collisions with vehicles during construction and operation of the relocated road. Training for construction personnel will reduce the likelihood of unintentional trespass and impacts to wildlife from shooting, companion dogs, and other potential disturbances. Timely implementation of these measures in suitable habitat on- and off-site within the TBNG, along with additional voluntary conservation measures being implemented by PPRM and adjacent mines as part of the ongoing CCAA/CCA development, will further reduce impacts.

## **Other Mammals, Reptiles, and Sharp-tailed Grouse**

Medium-sized mammals (such as lagomorphs, coyotes, and foxes) could be temporarily affected during construction. Direct losses of small mammals and reptiles would be higher than for other wildlife because their mobility is more limited and many will retreat into burrows when disturbed. However, the timing of the project and the high reproductive potential of these species would minimize such impacts. Due to the absence of sharp-tailed grouse from the area, the Proposed Action will have no impact on this species.



### **Cumulative Effects for the Proposed Action**

General short- and long-term cumulative effects under the Proposed Action are the same as those described for other species, above, with disturbances arising from multiple sources currently present or potentially occurring on lands within the Mackey Road Relocation analysis area. Examples of such disturbances include, but are not limited to, energy projects, transportation infrastructure, utility and communication lines, grazing, and various forms of recreation. Minerals extraction is expected to increase in portions of the analysis area within the reasonably foreseeable future. Disturbances such as pipelines, power lines, roads, and facilities tend to fragment or reduce the effectiveness of remaining habitats within the vicinity of development. In addition, these activities often result in increased noise and dust levels, new long-term or permanent facilities, potential introduction of invasive and/or weedy plant species, and a generally increased human presence, among others. Factors such as drought, the appearance of new diseases, and changes in the local fire regime also can compound cumulative impacts. An incremental loss of wildlife habitat will occur in the general vicinity as a result of several of these factors, with some wildlife species affected until reclaimed habitats are established in disturbed areas outside permanent rights-of-way or plant succession restores areas affected by natural causes such as fire or drought. A total of 85.7 additional acres of long-term disturbance on NFS lands will occur under the Proposed Action.

The overall result of implementing either alternative for the proposed project will be that some individuals may be lost or exhibit avoidance behaviors and shifts in habitat use (e.g., elk). For most species, cumulative impacts are not expected to significantly reduce the size or viability of either their local populations or the Grassland-wide populations. Neither the Proposed Action nor the No Action alternative will conflict with the current Grassland Plan, or any future objectives to manage the TBNG for the other species evaluated.

Mixed sagebrush-grasslands, upland grasslands (including prairie dog colonies), and limited aquatic and wetland resources occur within the proposed project area; the majority of project-related disturbances will occur in upland grassland habitats. Only a small (0.2 acre) portion of one active prairie dog colony falls within the project area (construction corridor) itself. That acreage represents less than 0.04% of the total acreage of active colonies within the surrounding 1.0-mile analysis area. A total of 3.99 non-contiguous acres of wetlands were delineated on NFS lands within the Mackey Road analysis area (right-of-way and 1,000-foot buffer). Few, if any, trees will be disturbed in the project area, though cottonwoods and pine breaks are present along the two primary creeks and on some ridges along the proposed right-of-way.

Due to the lack of occurrence of most species in the area, the timing and location of the project, and its relatively limited nature and duration, the PPRM Mackey Road Relocation project is not expected to increase the potential cumulative impacts to a point that would negatively impact populations of any species discussed in this document. The species most likely to experience impacts from the Proposed Action have large populations within TBNG or are sufficiently generalist and mobile in their habitat use to avoid detrimental impacts. Furthermore, the Proposed Action would not conflict with the current Grassland Plan, or any future objectives to manage wildlife resource on the TBNG.

### Determination of Effects and Rationale for Other Wildlife Species

Both the Proposed Action and No Action alternative **may impact individuals but not likely to cause a trend to federal listing or loss of viability in the planning area** for other wildlife species in the project and analysis area.

### Short-Term Use/Long-Term Productivity, Unavoidable Adverse Impacts, Irreversible or Irretrievable Commitments of Resources for Cultural Resources

No loss in long-term productivity is expected under either alternative.

No unavoidable adverse effects are expected under either alternative.

The character of the area will not be changed by either alternative. Given that mitigation requirements will be implemented for sage-grouse that can also benefit other sagebrush-obligate or dependent species, no irreversible or irretrievable impacts on wildlife resources will occur under either alternative. Those requirements will be supplemented with voluntary conservation measures implemented in suitable habitat elsewhere in the TBNG.

## 3.5 Vegetation Resources

The vegetation analysis area is limited to a 300- to 700-foot wide corridor centered over the 8.72 mile proposed road relocation. Consequently, habitat descriptions in that narrow band may not reflect the conditions present throughout the greater survey perimeter for other resources. More detailed information regarding plant species of concern is available in the vegetation Biological Assessment/Biological Evaluation and Plant Species of Local Concern reports for this project, on file with the USFS Douglas Ranger District office.

Vegetation analyses presented in this DEIS tier to at least 13 separate NEPA analyses for projects on NFS land that have already been approved by the USFS. Nine of the 13 analyses were for Biological Assessments/Biological Evaluations (BA/BEs), 3 were for environmental assessments, and 1 was for another EIS.

- School Creek Mine Ancillary Facilities Special Use Permit Environmental Assessment (2012)
- North Antelope Rochelle Mine North Pit 69 kV Power Line Relocation and School Creek Mine 69 kV Power Line Spur Environmental Assessment (2010);
- Wright Area Coal LBA Final Environmental Impact Statement (2010);
- Thunder Basin Travel Management Plan BA/BE (2009);
- Antelope Road Relocation Environmental Assessment (2009);
- Highway 450 to School Creek Mine Power Line BA/BE (2008);
- NARM's LBA3 Umbrella BA/BE (2006);
- Kennecott Energy's Antelope Coal Mine 69 kV Transmission Line Project BA/BE (2005);
- Boss Draw Power Line BA/BE (2005);
- AVF Exchange Drilling BA/BE (2005);
- Teckla Bulk Transmission Substation Enlargement BA/BE (2002);
- Porcupine (a.k.a. Teckla) Distribution Substation and Tie Line BA/BE (2002); and
- East Teckla Power Distribution Lines for the Peabody Gas Wells BA/BE (2002).

The vegetation analysis area contains Big Sagebrush Shrubland, Upland Grassland, Breaks Grassland, and Scoria Grassland vegetation communities. The Big Sagebrush Shrubland vegetation community is characterized by rolling upland terrain with greater than 20% shrub cover. Dominant shrubs and sub-shrubs species include big sagebrush and fringed sagewort (*Artemisia frigida*). The dominant understory plant species include needle-and-thread, western wheatgrass, prairie junegrass, and cheatgrass.

The Upland Grassland vegetation community is characterized by rolling upland terrain with less than 20% shrub cover. Dominant plant species include western wheatgrass, needleandthread, prairie junegrass, and plains prickly pear (*Opuntia polyacantha*).

The Breaks Grassland vegetation community is characterized by rough, broken topography dissected by small drainages or draws. Dominant shrubs and sub-shrubs species include big sagebrush and rubber rabbitbrush (*Ericameria nauseosa*). The dominant understory plant species include needleandthread, bluebunch wheatgrass (*Elymus spicatus*), threadleaf sedge (*Carex filifolia*), and little bluestem.

The Ponderosa Pine Woodland vegetation community also was present in pockets on the hill sides. This community is characterized by rough, broken topography dissected by small drainages or draws. Ponderosa pine dominated the overstory within this community.

The Scoria Grassland vegetation community is characterized by gently rolling to rough hills with low relatively low vegetation cover and coarse soils underlain by scoria parent material. Dominant plant species include: broom snakeweed, threadleaf sedge, prairie junegrass, and blue grama.

The soils within the project area consist mainly of fine, loamy, and fine loamy textures with the occasional coarse loamy texture.

## Existing Conditions

### 3.5.1 Threatened, Endangered, and Proposed Plant Species Considered and Evaluated

Kelly (2009) lists two plant species for site-specific consideration in project planning on the Thunder Basin National Grassland (TBNG) (Table 3/6):

1. the endangered blowout penstemon (*Penstemon haydenii*)
2. the threatened Ute ladies'-tresses (*Spiranthes diluvialis*).

Pedestrian and vehicular reconnaissance habitat and species surveys were conducted for Ute-ladies'-tresses during the approved survey window in August 2006, November 2010, July 2010, and August 2011. Vehicular and pedestrian field reconnaissance habitat and species surveys for blowout penstemon were conducted on June 17, 18, 25, and 28, 2010.

Table 3-6. Occurrence and availability of suitable habitat for federally Endangered, Threatened, Proposed, or Candidate plant species within the Mackey Road Relocation analysis area.

Evaluated Species	Potential for Occurrence in Project Area	Occurrence in Local Area	Presence of Habitat in Project Area
Blowout penstemon <sup>E</sup> <i>Penstemon haydenii</i>	Very Unlikely <sup>1</sup>	Undocumented	No suitable habitat within the analysis area due to the lack of deep sandy soils and blowout or dune habitats.
Ute ladies'-tresses <i>Spiranthes diluvialis</i> <sup>T</sup>	Very Unlikely <sup>1</sup>	Undocumented	No suitable habitat within the analysis area due to the lack of a consistent late season perennial water source, the presence of undercut banks causing abrupt transition zones, and fine textured soils in the transition zone.

<sup>1</sup> Based on habitat requirements and known range.

<sup>E</sup> Classified as "Endangered" under the U.S. Endangered Species Act of 1973.

<sup>T</sup> Classified as "Threatened" under the U.S. Endangered Species Act of 1973.

Blowout penstemon is identified as occurring on sand dunes and associated blowouts below 8,000 feet in elevation. Heidel (2008) indicates that it is currently known to occur on the rim and lee slopes of blowouts and associated steep slopes deposited at the base of foothills. In Wyoming, the habitat is typically found on sandy aprons or the lower half of steep sandy slopes deposited at the base of granitic or sedimentary mountains or ridges (Fertig 2001a). In Nebraska, it occurs in sparsely vegetated, early successional, shifting sand dunes and blowout depressions created by wind (Fritz et al. 1992).

Based on TBNG soils data and 2010 survey results, no blowout penstemon individuals, populations, or suitable habitat is present within the analysis area. Soils derived from eolian sources with high wind erosion potential, present within the analysis area, were stabilized by a moderate to high percentage of vegetation cover preventing the development of blowout and dune habitats required for the establishment of blowout penstemon individuals or populations. Non-vegetated sandy soils within the analysis area were not characteristic of blowout penstemon habitat. Therefore, blowout penstemon was not carried further in the analysis.

Ute ladies'-tresses occur along riparian edges, gravel bars, old oxbows, high flow channels, and moist to wet meadows along perennial streams. It typically occurs in stable wetland and seep areas associated with old landscape features within historical floodplains of major rivers. It also is found in wetland and seep areas near freshwater lakes or springs (USFWS 1995). Soils range from alluvial sand and coarse silt to whitish loamy clays with a pH between 7.7 and 7.8, derived from alluvial deposits on sandstones and claystones (Fertig and Heidel 2007). In any given year, mature plants are in flowering, non-flowering (vegetative) and seasonally dormant stages persisting belowground (USFWS 1995).

Ute ladies'-tresses have been found adjacent to the TBNG on BLM, and state land, but it is yet to be discovered on National Forest System (NFS) lands in the TBNG (Chumley et al. 1998, Fertig and Heidel 2007, Heidel 2001, 2007a). Heidel (2007a) states that the Ute ladies'-tresses is known in eastern Wyoming "from three geographic centers of distribution...a portion of the Antelope Creek watershed, a portion of the Niobrara River watershed, and a portion of the Horse Creek watershed." The analysis area is not located within any of these three watersheds. The nearest known occupied habitat is approximately 30 miles from the proposed road relocation.

Local habitat was confirmed unsuitable for Ute ladies'-tresses within the analysis area, based on 2010 surveys. The analysis area crosses Little Thunder Creek and School Creek; however, both creeks did not provide an adequate late season perennial water source for Ute ladies'-tresses. The isolated and inconsistent nature of the late season perennial water source, undercut banks, abrupt transitions, fine textured soils, and the lack of associated species along both creeks provide unsuitable habitat. Therefore, Ute ladies'-tresses was not carried further in the analysis.

### Environmental Consequences (Effects Analysis)

A summary of determinations of effect based on recent survey efforts and documented vegetative and soil characteristics in the area is provided in Table 3-7.

Table 3-7. Determinations of effect and their primary justification for federally Endangered, Threatened, Proposed, or Candidate plant species within the Mackey Road Relocation analysis area.

Evaluated Species	Effects Determination		Justification
	Alternative 1	Alternative 2	
Blowout penstemon	<i>No Effect</i>	<i>No Effect</i>	No suitable habitat in project area; individuals absent during 2010 survey.
Ute ladies'-tresses	<i>No Effect</i>	<i>No Effect</i>	No suitable habitat in project area; individuals absent during 2010 surveys.

#### Alternative 1: No Action

Under the No Action alternative, the existing alignments of the Mackey County Road and the directly adjoining segment of the Temporary Reno Road will be retained, and no new road construction will occur. Mining will not occur under the approximately 6.1 miles of the existing Mackey County Road and 2.2 miles of existing Temporary Reno Road within the NARM permit area.

No new impacts to federally listed plant species or their habitats associated with the Mackey Road Relocation Project will occur under the No Action alternative.

### Alternative 2: Proposed Action

Based on the above information regarding the lack of individuals and their potential habitats within the project area, no new impacts to federally listed plant species will occur under the Proposed Action.

### Cumulative Effects for the Proposed Action

Cumulative effects are described as the effects of the action when added to past, on-going, or reasonably foreseeable actions (36 CFR § 220.4 (f) of 07/24/08). As no direct or indirect effects of the action will occur as a result of the Proposed Action, no cumulative effects will result from the project.

### Determination of Effects and Rationale

The No Action alternative will have **no effect** on blowout penstemon or Ute ladies'-tresses due to the absence of individuals and their potential habitats.

Implementation of the Proposed Action also will have **no effect** on blowout penstemon or Ute ladies'-tresses due to the absence of individuals and their potential habitats.

### 3.5.2 USFS Region 2 - Sensitive Plant Species

The 2009 Region 2 Sensitive Species list includes 91 species, of which, 10 are known to occur or are suspected (biologically or geographically) to occur on the TBNG (Roche 2009b). The 2009 Region 2 Sensitive plant species list was utilized in 2010, as no new plant species were added to the list. Potential effects are evaluated if individuals are present, or if suitable but unoccupied habitat is present and inventory methods are not feasible or effective for providing information on presence/absence or number and location of individuals. No further analysis is required for species that are not known or suspected to occur in the project area, and for which no suitable habitat is present (Thompson 2001). Additional details regarding Region 2 Sensitive plant species can be found in the vegetation Biological Assessment/Biological Evaluation/Plant Species of Local Concern report for this project, on file with the USFS Douglas Ranger District.

### Existing Conditions

Of the 10 sensitive plant species that could be present, none occurred within or near the analysis area during pedestrian and vehicular reconnaissance surveys conducted in 2006 and 2010 (BKS 2006 and 2010). However, potential habitat for common twinpod (*Physaria didymocarpa* var *lanata*) was identified within the analysis area. Summary information regarding the occurrence of each Region 2 Sensitive plant species on the TBNG, presence of appropriate habitat in the analysis area, and rationale for analysis is presented in Table 3-8.

Common twinpod "occur on redbed clay-shale slopes, limey-sandstone outcrops, roadcuts, and other exposed rock-cliff substrates at 3,600 to 9,680 feet" (Fertig 2006). In Wyoming, common twinpod typically ranges from 4,600 to 7,000 feet (Heidel and Handley 2004). The potential common twinpod habitat is located in T42N, R69W, NESW Section 7; N½N½SE¼

Section 21; and N½NW Section 27. The potential habitat identified within the project area consisted of scoria hills (10 to 25%) with moderate vegetation cover and scoria outcrops.

### **Environmental Consequences (Effects Analysis)**

A summary of determinations of effect based on recent survey efforts and documented vegetative and soil characteristics in the area is provided in Table 3-9.

#### **Alternative 1: No Action**

Under the No Action alternative, the existing alignments of the Mackey County Road and the directly adjoining segment of the Temporary Reno Road will be retained, and no new road construction will occur. Mining will not occur under the approximately 6.1 miles of the existing Mackey County Road and 2.2 miles of existing Temporary Reno Road within the NARM permit area.

No new impacts to Region 2 Sensitive plant species or their potential habitats associated with the Mackey Road Relocation project will occur under the No Action alternative.

#### **Alternative 2: Proposed Action**

Under the Proposed Action, the potential Region 2 Sensitive plant species, common twinpod, habitat identified within the analysis area may potentially be impacted; however, no individuals or populations will be affected. Impacts associated with the Proposed Action to Region 2 Sensitive plant species potential habitat will be minimal. Implementation of the Proposed Action will primarily affect the Big Sagebrush Shrubland and Upland Grassland vegetation communities. The scoria hills which are associated with potential common twinpod habitat are small and the impacts will be minimal. Impacts to the common twinpod habitat will be minimal and primarily indirect. Potential indirect effects include minor erosion, sediment deposition, and runoff during construction and prior to reclamation. The use of appropriate best management practices for erosion control, as needed, will minimize the potential for such impacts. Disturbance of the soil resulting from the Proposed Action may create conditions suitable for noxious and invasive species to reproduce. An increase in noxious and invasive species occurrence due to increased traffic and soil disturbance within the project area is expected. However, during construction control of noxious and invasive species will be performed by the contractor. After construction is complete, the county will control noxious weeds. The reclamation of this area will be done using best management practices and USFS regulations and requirements.

Table 3-8. Analysis rationale and summary for Region 2 Sensitive plant species potentially occurring in the Mackey Road Relocation analysis area.

Common Name <i>Scientific Name</i>	Occurrence on TBNG	Suitable Habitat in Analysis Area	Rationale If Not Carried Forward for Analysis
Barr's milkvetch <i>Astragalus barrii</i>	Documented	Yes	Evaluated - local habitat confirmed unsuitable due to lack of calcareous parent material and suitable breaks habitat.
Iowa moonwort <i>Botrychium campestre</i>	Suspected	No	Local habitat confirmed unsuitable due to the lack of dunes or fields.
Narrowleaf moonwort <i>Botrychium lineare</i>	Possibly	No	Local habitat confirmed unsuitable; sandy soils present are not of calcareous sandstone or limestone parent material.
Foxtail sedge <i>Carex alopecoidea</i>	Suspected	No	Local habitat confirmed unsuitable due to the lack of lack streams and associated species.
Prairie dodder <i>Cuscuta plattensis</i>	Suspected	No	Local habitat confirmed unsuitable due to the lack of habitat and associated species.
Elliptic spikerush <i>Eleocharis elliptica</i>	Suspected	No	Local habitat confirmed unsuitable due to the lack of seepage areas and adequate moisture regime.
Visher's buckwheat <i>Eriogonum visherii</i>	Suspected	No	Local habitat confirmed unsuitable; eroded banks and soils with badland inclusions do not fit the ecological description of a badland.
Plains rough fescue <i>Festuca hallii</i>	Suspected	No	Local habitat confirmed unsuitable due to lack of volcanic black soils, limestone plains, tundra zones, or montane meadows.
Common twinpod <i>Physaria didymocarpa</i> var. <i>lanata</i>	Suspected	Yes	Evaluated - local habitat confirmed suitable.
American cranberrybush <i>Viburnum opulus</i> var. <i>americanum</i>	Suspected	No	Local habitat confirmed unsuitable due to the lack of adequate moisture regime and associated woodlands.

\*Based on field surveys conducted on June 17, 18, and 25, 2010; August 20, 2010; November 2, 2010; and 2006 field surveys.



Table 3-9. Determinations of effect and their primary justification for Region 2 Sensitive plant species within the Mackey Road Relocation analysis area.

Evaluated Species	Effects Determination		Justification
	Alternative 1*	Alternative 2	
Common twinpod	Not likely to cause a trend towards federal listing.	Not likely to cause a trend towards federal listing.	Individuals absent during 2006 and 2010 surveys; limited project-related disturbance in potential habitat.

\* Effects under the No Action alternative would be due to the continued presence of previously authorized energy and recreation activities.

### Cumulative Effects for the Proposed Action

Cumulative effects are described as the effects of the Proposed Action when added to past, on-going or reasonably foreseeable actions (36 CFR § 220.4 (f) of 07/24/08). The cumulative effects within the Mackey Road Relocation analysis area will be minimal, if any, due to the lack of either an established population or the identification of individuals within the analysis area, and the isolated occurrences of potential habitat along the proposed route. The Proposed Action, during construction, may cause disturbance to the potential habitat of Region 2 Sensitive plant species, thus decreasing the amount of potential habitat in the analysis area. The response of common twinpod to disturbance is not well known. It is likely that the disturbance will not create any potential habitat due to the unique characteristics of the habitat. The cumulative effects on the continued existence of common twinpod populations upon the TBNG will be that of natural process that may result in a slow change in the vegetation communities. Existing activities in the area including those associated with energy and recreational activities will continue to occur and may introduce noxious weeds into the analysis area.

### Determination of Effects and Rationale

The No Action alternative is **not likely to cause a trend towards federal listing** of Region 2 Sensitive plant species due to the absence of individuals and/or the limited project-related disturbance in potential habitat.

Implementation of the Proposed Action also would **not likely cause a trend toward federal listing** on Region 2 Sensitive plant species due to the absence of individuals and/or the limited project-related disturbance in potential habitat.

### 3.5.3 Plant Species of Local Concern

Species of Local Concern are species that are documented or suspected to be at risk at a forest-wide scale, but do not meet the criteria for regional Sensitive plant species designation because they are reasonably secure in parts of their range. These could include species with declining trends in only a portion of that region. Risk to species viability may differ at national, regional, and local scales. Plant species at the edge of their range may not merit regional Sensitive plant species status, but may be important elements of biological diversity for the Forest/Grassland unit (USFS 2003). Not all plant species listed are considered to be of

local concern for a particular analysis area. No further analysis is required for plant species that are not known or suspected to occur in the analysis area, and for which no suitable habitat is present (Thompson 2001). Potential effects are evaluated if suitable but unoccupied habitat is present and inventory methods are not feasible or effective for providing information on presence/absence or number and location of individuals. Additional details regarding plant Species of Local Concern can be found in the vegetation Biological Assessment/Biological Evaluation/Plant Species of Local Concern report for this analysis area, on file with the USFS Douglas Ranger District.

## Existing Conditions

Of the 16 plant Species of Local Concern on the TBNG, none occurred within or near the analysis area during the pedestrian and vehicular reconnaissance surveys conducted on June 17, 18, and 25, 2010. However, potential habitat for desert false indigo (*Amorpha fruticosa*), Watson's goosefoot (*Chenopodium watsonii*), bitter root (*Lewisia rediviva*), rosy palafox (*Palafoxia rosea* var. *macrolepis*) and lemon scent (*Pectis angustifolia*) was identified within the analysis area. Habitat for vagrant lichens is present in the analysis area; however, habitat for new Wyoming Xanthoparmelia lichen (*Xanthoparmelia neowyomigicia*) is thought to be higher in elevation than the analysis area (Hale 1989, 1990, McCune and Goward 1995). Summary information regarding the occurrence of each plant Species of Local Concern on the TBNG, presence of appropriate habitat in the project area, and rationale for project is presented in Table 3-10.

Desert false indigo is a 6-10 foot, loose, airy shrub which often forms dense thickets. The leaves are pinnately compound. The leaflets are velvety on the lower surface, margins frequently almost parallel, often abruptly rounded at both ends and with a notch at the tip. Flowers are small, purple to dark blue with yellow stamens extending beyond the single petal, crowded in narrow, 3-6 inch groups (Lady Bird Johnson Wildlife Center 2010). Desert false indigo is commonly found on wet ground along rivers, streams, ponds, and ditches and occasionally in open wet woods. It requires well-drained soil and can grow in nutritionally rich soil. This plant prefers acid, neutral, or basic soils. It is adaptable to infertile, dry, and sandy soils (NPDC 2010).

Watson's goosefoot is a tap-rooted annual forb that ranges from 2 to 20 centimeters (cm) in height. The stems are erect to ascending, simple to branched, grooved, angular, and mealy. The leaves are alternate, stalked, 1 – 3 cm long, 1 – 1.5 cm wide, more or less circular, base wedge-shaped, tip rounded or obtuse, thick to fleshy, mealy, greyish-green below, margin entire, occasionally with one or two basal teeth or lobes. The inflorescences are large head-like clusters in short, dense, leafy terminal or axillary spikes. The flowers have sepals and petals that are oval, densely mealy, enclosing seed at maturity; stamens five; stigmas two. The seeds are horizontal and the plant has an odor of dead fish (University of Saskatchewan 2010). Watson's goosefoot is commonly found in woods and shrublands of various types, badlands, erosion breaks in prairies, volcanic rocks, pinyon and juniper, sagebrush, disturbed ground, old mine areas, and roadsides (Flora of North America 2010).

Table 3-10. Analysis rationale and summary for plant Species of Local Concern potentially occurring in the Mackey Road Relocation analysis area.

Common Name <i>Scientific Name</i>	Occurrence on TBNG	Rationale If Not Carried Forward for Analysis
Narrowleaf water plantain <i>Alisma gramineum</i>	Documented	Local habitat confirmed unsuitable
Desert false indigo <i>Amorpha fruticosa</i>	Remotely possible	Evaluated - local habitat confirmed suitable
Summer milkvetch <i>Astragalus hyalinus</i>	Documented	Local habitat confirmed unsuitable
Large water-starwort <i>Callitriche heterophylla</i>	Documented	Local habitat confirmed unsuitable
Sartwell's sedge <i>Carex sartwellii</i> var. <i>sartwellii</i>	Suspected	Local habitat confirmed unsuitable
Smooth goosefoot <i>Chenopodium subglabrum</i>	Suspected	Local habitat confirmed unsuitable
Watson's goosefoot <i>Chenopodium watsonii</i>	Documented	Evaluated - local habitat confirmed suitable
Slimleaf panicgrass <i>Dichanthelium linearifolium</i>	Suspected	Local habitat confirmed unsuitable
Bitter root <i>Lewisia rediviva</i>	Documented	Evaluated - local habitat confirmed suitable
Rocky Mountain blazing Star <i>Liatris ligulistylis</i>	Vicinity	Local habitat confirmed unsuitable
Wood lily <i>Lilium philadelphicum</i>	Suspected	Local habitat confirmed unsuitable
Rosy palafox <i>Palafoxia rosea</i> var. <i>macrolepis</i>	Documented	Evaluated - local habitat confirmed suitable
Lemon scent <i>Pectis angustifolia</i>	Documented	Evaluated - local habitat confirmed suitable
Fineleaf pondweed <i>Stuckenia filiformis</i>	Documented	Local habitat confirmed unsuitable
Sago pondweed <i>Stuckenia pectinata</i> )	Documented	Local habitat confirmed unsuitable
New Wyoming Xanthoparmelia lichen <i>Xanthoparmelia neowyomigicia</i>	Suspected	Evaluated-local habitat confirmed unsuitable

Bitter root is a tap-rooted perennial forb with stems 1 to 3 cm tall, leaves basal fleshy, 1.5-5 cm. long, linear and nearly terete, with a broad, translucent base, withering by flowering time. The flowers are described as follows: solitary, the scape with a whorl of 5-6 linear, scarious bracts 5-10 millimeter (mm) long; pedicel about equal to the scape, jointed just above the bracts; sepals 6-9, oval, 10-25 mm long, unequal, whitish to deep pink; petals about 15, narrowly oblong-lanceolate, 18-35 mm. long, deep rose to white; stamens 30-50; style 1, with 4-8 elongate stigmas” (USDA NRCS 2009). Bitter root grows in open woodlands and sagebrush shrublands with pine, oak or juniper in many soil types such as shale, sand, clay,

granite, serpentine, or talus (NPDC 2010). It also grows on well-drained, exposed gravelly benches, river bars, plains, stony slopes, and open ridges (USDA NRCS 2009).

Rosy palafox is a relatively short, tap-rooted annual herb with flower heads arranged in an open, terminal, corymb-like cluster with rose to pinkish disk corollas (Fertig 2001a). The plant blooms from mid-June through early September. Rosy palafox is found on sandy soils in plains, range-wide. In Wyoming, populations occur in mixed-grass prairie and sandy sagebrush communities on knolls and slopes, typically at elevations ranging from 4,100 to 4,860 feet (Fertig 2001a). Only one known occurrence has been documented on the TBNG.

Lemon scent grows to 10-20 cm tall and has simple, gland dotted leaves that are linear. The leaves are arranged in an opposite orientation on a yellowish-glandular stem. The ray flowers are yellow and the fruits are pubescent black achenes with a crownlike pappus. Lemon scent is lemon scented (Fertig 2001c). Lemon scent is found in mountain shrublands and grasslands on sandbars in sandy ravines, gravel hills, or scoria outcrops of red clinker. The elevation ranges between 4,000 and 4,800 feet (Fertig 2001c).

### **Environmental Consequences (Effects Analysis)**

A summary of determinations of effect based on recent survey efforts and documented vegetative and soil characteristics in the area is provided in Table 3-11.

#### **Alternative 1: No Action**

Under the No Action alternative, the existing alignments of the Mackey County Road and the directly adjoining segment of the Temporary Reno Road will be retained, and no new road construction will occur. Mining will not occur under the approximately 6.1 miles of the existing Mackey County Road and 2.2 miles of existing Temporary Reno Road within the NARM permit area.

No new impacts to plant Species of Local Concern associated with the Mackey Road Relocation project will occur under the No Action alternative.

#### **Alternative 2: Proposed Action**

Under the Proposed Action the potential plant Species of Local Concern, habitat identified within the analysis area may be potentially impacted; however, no individuals or populations will be affected. Impacts associated with the Proposed Action to desert false indigo, Watson's goosefoot, bitter root, rosy palafox, and lemon scent potential habitat will be minimal. Surveys were conducted in nearby areas during the 2005 School Creek Mine baseline vegetation survey, the 2005 NARM Umbrella Biological Assessment/Biological Evaluation, and the 2006 School Creek Mine Umbrella Biological Assessment/Biological Evaluation. All completed surveys found potential habitat present but no individuals or populations of desert false indigo, Watson's goosefoot, bitter root, rosy palafox, and lemon scent, and New Wyoming Xanthoparmelia lichen. The response of desert false indigo, Watson's goosefoot, bitter root, rosy palafox, and lemon scent, and New Wyoming Xanthoparmelia lichen Table 3-11. Determinations of effect and their primary justification for plant Species of Local

Concern within the Mackey Road Relocation analysis area.

Evaluated Species	Effects Determination		Justification
	Alternative 1*	Alternative 2	
Desert false indigo	<i>Assuming presence no loss of viability</i>	<i>Assuming presence no loss of viability</i>	Individuals absent during 2006, and 2010 surveys; limited project disturbance in potential habitat.
Watson's goosefoot	<i>Assuming presence no loss of viability</i>	<i>Assuming presence no loss of viability</i>	Individuals absent during 2006, and 2010 surveys; limited project disturbance in potential habitat.
Bitter root	<i>Assuming presence no loss of viability</i>	<i>Assuming presence no loss of viability</i>	Individuals absent during 2006, and 2010 surveys; limited project disturbance in potential habitat.
Lemon scent	<i>Assuming presence no loss of viability</i>	<i>Assuming presence no loss of viability</i>	Individuals absent during 2006, and 2010 surveys; limited project-related disturbance in potential habitat.
Rosy palafox	<i>Assuming presence no loss of viability</i>	<i>Assuming presence no loss of viability</i>	Individuals absent during 2006, and 2010 surveys; limited project-related disturbance in potential habitat.
New Wyoming Xanthoparmelia lichen	<i>Assuming presence no loss of viability</i>	<i>Assuming presence no loss of viability</i>	Individuals absent during 2006, and 2010 surveys; limited project-related disturbance in potential habitat.

\* Effects under the No Action alternative would be due to the continued presence of other non-coal related activities.

to disturbance is not well known. The effects to desert false indigo habitat will be minimal as the stream crossings would be maintained. The scoria hills which are associated with potential lemon scent habitat are small and the impacts will be minimal. The potential habitat for the remaining species is small and impacts to those habitats will be minimal.

Potential indirect effects include minor erosion, sediment deposition, and runoff during construction and prior to reclamation. The use of silt fences, straw bale dikes, mats, mulch and other appropriate best management practices, as needed, will minimize the potential for such impacts. Disturbance of the soil resulting from the Proposed Action may create conditions suitable for noxious and invasive species to reproduce. An increase in noxious and invasive species occurrence due to increased traffic and soil disturbance within the project area is expected. However, during construction control of noxious and invasive species will be performed by the contractor. After construction is complete, the county will control noxious weeds. The reclamation of this area will be done using best management practices and USFS regulations and requirements.

### Cumulative Effects for the Proposed Action

Cumulative effects are described as the effects of proposed actions when added to past, on-going or reasonably foreseeable actions (36 CFR § 220.4 (f) of 07/24/08). The cumulative effects on desert false indigo, Watson's goosefoot, bitter root, rosy palafox, and lemon scent due to the Proposed Action would be minimal, if any, due to the lack of either an established population or the identification of individuals within the analysis area. The Proposed Action may cause disturbance to the potential habitat of desert false indigo, Watson's goosefoot, bitter root, rosy palafox, and lemon scent, thus decreasing the amount of potential habitat in the analysis area. The proposed road may result in an increase of noxious weed and invasive species populations in the project area. However, the No Action alternative also would be subject to invasive weed spread due to existing and expanding development in the area. Consequently, the intensity of the noxious weed cumulative effect is low because the No Action alternative also will have cumulative effects in regards to noxious weeds. The cumulative effects of noxious weed invasion will be mitigated by the county. However, due to the unique characteristics of these plant's habitat requirements, it is not likely that disturbance associated with the road relocation will create any new potential habitat for this species

### **Determination of Effects and Rationale**

No individuals were observed during surveys; however, assuming presence, the No Action alternative will result in **no loss of viability** for plant Species of Local Concern due to the lack of project-related disturbance in potential habitat and/or the absence of individuals.

No individuals were observed during surveys; however, assuming presence, implementation of the Proposed Action also will result in **no loss of viability** for plant Species of Local Concern due the limited project-related disturbance in potential habitat and/or the absence of individuals.

### **Short-Term Use/Long-Term Productivity, Unavoidable Adverse Impacts, Irreversible or Irretrievable Commitments of Resources for Cultural Resources**

No loss in long-term productivity is expected under either alternative.

No unavoidable adverse effects are expected under either alternative.

The character of the area will not be changed by either alternative. No irreversible or irretrievable impacts on vegetation resources will occur under either alternative.

## **3.6 Soils**

### **Existing Conditions**

The project area (construction corridor) will be approximately 300 feet wide along the majority of the route; it will be 700 feet wide for approximately 4,500 feet near the northern end of the project area. All disturbances on NFS lands will occur within that 300- to 700-foot wide corridor. Currently, the majority of the project area is undisturbed and in a relatively native condition. Some minor surface disturbances originating from livestock grazing, utility lines, road crossings, and communication lines are present. Conventional oil and gas

development and surface coal mines occur in the vicinity, but are located outside the proposed project area.

The soils present within the project area consist mainly of fine, loamy, and fine loamy textures, with the occasional coarse loamy texture. Soils in that area were identified mostly by associations or complexes of soil series, as well as some consociations and undifferentiated groups. The soil depths and types around the project area are similar to soils currently being salvaged and utilized for reclamation at the adjacent NARM and School Creek Mine.

No unstable mapping units have been identified within the project area. According to the TBNG soil classification system, the following mapping units in that area are considered potentially unstable: Hilight-Wags-Badland complex, 3-45% slopes; Ustic Torriorthents-Badland complex, 10-100% slopes; Wibaux-Wibaux, thin solum complex, 6-40% slopes; and Wibaux-Shingle-Badland complex, 6-60% slopes. These potentially unstable mapping units are located within the project area in T42N, R69W, NWNE Section 17, SENE Section 6, SESE Section 6, SWSE Section 6, and NESE Section 6. Table 3-12 provides a summary of soil series and map units found along the project area, as well as their selected erosion hazards as identified by the NRCS. Table 3-13 provides the NRCS ratings and limitations for local roads and streets and road fill.

Based on a search of the Campbell County hydric soils list, seven hydric soils are present within the project area; however, the representative percent composition is low. The project area contained the following designated Campbell County hydric soils: Bidman loam, 0-6% slopes; Bidman-Parmleed loam, 0-6% slopes; Cambria-Kishona-Zigweid loams, 0-6% slopes; Clarkelen-Embry fine sandy loams, 0-4% slopes; Arvada, thick surface-Arvada-slickspots complex, 0-6% slopes; Haverdad-Kishona association, 0 to 6% slopes; and Felix clay, ponded, 0-2% slopes. These map units are considered hydric soils due to inclusions of the Felix soil series, Boruff soil series, poorly drained soils and frequently ponded soils. These hydric soil map units are within the project area in T43N, R69W, SE Section 30; SENE Section 30, E½SE¼ Section 31; and T42N, R69W, SWSE Section 6; NWNE Section 7; NE Section 17; NESE Section 17; NWSW Section 16; SESE Section 32; and SW Section 33.

A total of 6.64 acres of hydric soils were identified during the on-site field investigations conducted in June 2011. Hydric soils are located in the affected reaches of School Creek and Little Thunder Creek, two playas, one reservoir, and various depressional areas within dry ephemeral drainages. See Table 3-14 in Section 3.7 for a complete listing of wetlands and hydric soils identified in the project area.

Table 3-12. Summary of soil series and map units found along the preferred route and construction corridor, as well as their selected erosion hazards as identified by the NRCS.

Map Symbol	Map Unit Description	Landform	Drainage Class	Series Textural Class	Parent Material	Water Erosion Hazard	Wind Erosion Hazard
102	Arvada, thick surface-Arvada-slickspots complex, 0-6 % slopes	Alluvial fan, fan remnant	Well drained	Fine	Alluvium derived by calcareous shale	Slight	Severe
109	Bidman loam, 0-6% slopes	Alluvial fan, fan remnant	Well drained	Fine	Alluvium derived by calcareous shale	Slight	Moderate
111	Bidman-Parmleed loam, 0-6% slopes	Hill, ridge	Well drained	Fine	Alluvium derived by calcareous shale and alluvium over residuum weathered by calcareous shale	Slight	Moderate
112	Bidman-Parmleed loam, 6-15% slopes	Hill, ridge	Well drained	Fine	Alluvium derived by calcareous shale and alluvium over residuum weathered by calcareous shale	Severe	Moderate
116	Cambria-Kishona-Zigweid loams, 0-6% slopes	Alluvial fan, fan remnant	Well drained	Fine-loamy	Sandstone and shale	Slight	Moderate
119	Clarkelen-Embry fine sandy loams, 0-4% slopes	Floodplain, stream terrace	Well drained	Coarse loamy	Alluvium derived from sandstone or shale/ alluvium and/or eolian deposits from sandstone	Slight	Severe
143	Felix clay, ponded, 0-2% slopes	Playas, depressions	Poorly drained	Very fine	Alluvium derived from shale	Moderate	Moderate
144	Forkwood loam, 0-6 % slopes	Alluvial fan, fan remnant	Well drained	Fine-loamy	Sandstone and shale	Slight	Moderate
153	Haverdad-Kishona association, 0 to 6% slopes	Floodplain, stream terrace	Well Drained	Fine-loamy	Alluvium derived from sandstone and shale	Slight /Moderate	Moderate
163	Hilight-Wags-Badland complex, 3-45% slopes	Hills, ridges, breaks	Well drained	Clayey/ Fine	Residuum or alluvium over residuum weathered from acid shale	Severe	Moderate
173	Lawver-Teckla-Wibaux complex, 0-6 % slopes	Mesa, terrace	Well Drained	Loam/ Very fine sandy loam/Very channery loam	Alluvium and/or eolian deposits over residuum weathered from porcellanite	Slight	Slight/ Moderate/ Severe
175	Lawver-Wibaux complex, 6-30% slopes	Terraces, hills, ridges	Well drained	Fine / Loamy	Alluvium and or eolian deposits over residuum weathered from porcellanite	Slight / Severe	Slight/ Moderate
190	Parmleed-Renohill complex, 3-15% slopes	Hill, ridge	Well drained	Fine	Alluvium over residuum weathered from calcareous shale	Moderate	Slight
200	Renohill-Savageton clay loams, 6-15% slopes	Hill, ridge	Well drained	Fine	Alluvium over residuum weathered from calcareous shale	Severe	Moderate
217	Theedle-Shingle loams, 3-30% slopes	Hill ridge	Well drained	Loamy / Fine loamy	Alluvium over residuum weathered from sandstone and shale	Moderate	Moderate
234	Ustic Torriorthents-Badland complex, 10-100% slopes	Hill, ridge	Well drained	Loamy / Fine loamy	Alluvium and/or residuum weathered from sandstone and shale	Severe	Severe
240	Wibaux-Wibaux, thin solum complex, 6-40% slopes	Hill, ridge	Well drained	Loamy	Alluvium and/or eolian deposits over residuum weathered from porcellanite	Moderate/ Severe	Slight/ Moderate
243	Wibaux, thick solum-Wibaux channery fine sandy loams, 3-40 % slopes	Hill, ridge	Somewhat excessively drained/ Well Drained	Channery fine sandy loam	Alluvium and/or colluvium over residuum weathered from porcellanite	Severe	Moderate
245	Wibaux-Shingle-Badland complex, 6-60% slopes	Hill, ridge	Well drained	Loamy	Alluvium and/ or eolian deposits over residuum weathered from porcellanite / residuum weathered from sandstone and shale	Severe	Slight/ Moderate



Table 3-13. NRCS ratings and limitations for local roads and streets, and road fill.

Map Symbol	Map Unit Description	Local Roads and Streets	Limitation	Source of Road fill	Limitation
102	Arvada, thick surface-Arvada-slickspots complex, 0-6 % slopes	Severe	Low strength, shrink swell	Poor	Low strength, shrink swell
109	Bidman loam, 0-6% slopes	Severe	Low strength	Fair	Low strength, shrink swell
111	Bidman-Parmleed loam, 0-6% slopes	Severe	Low strength	Poor	Low strength, depth to rock
112	Bidman-Parmleed loam, 6-15% slopes	Severe	Low strength	Poor	Low strength, depth to rock
116	Cambria-Kishona-Zigweid loams, 0-6% slopes	Moderate / Severe	Low strength, shrink swell	Poor / Fair	Low strength, shrink swell
119	Clarkelen-Embry fine sandy loams, 0-4% slopes	Slight / Severe	Flooding	Good	N/A
143	Felix clay, ponded, 0 to 2% slopes	Very limited	Depth to saturated zone, shrink swell	Poor	Shrink swell, wetness depth, low strength
144	Forkwood loam, 0-6 % slopes	Severe	Low strength	Poor	Low strength
153	Haverdad-Kishona association, 0 to 6% slopes	Severe	Low strength, flooding	Poor	Low strength
163	Hilight-Wags-Badland complex, 3-45% slopes	Moderate / Severe	Low strength, shrink swell, slope, depth to bedrock	Poor	Low strength, shrink swell, depth to rock
173	Lawver-Teckla-Wibaux complex, 0-6 % slopes	Slight / Moderate / Severe	Shrink swell, large stones	Poor / Good	Large stones
175	Lawver-Wibaux complex, 6-30% slopes	Moderate / Severe	Shrink swell, slope, depth to bedrock	Poor / Good	Large stones
190	Parmleed-Renohill complex, 3 to 15% slopes	Very limited	Shrink swell, low strength	Poor	Depth to bedrock, low strength, shrink swell
200	Renohill-Savageton clay loams, 6-15% slopes	Severe	Low strength, shrink swell	Poor	Low strength, shrink swell, depth to rock
217	Theedle-Shingle loams, 3-30% slopes	Very limited	Depth to soft bedrock, too steep	Poor	Depth to bedrock, low strength, shrink swell
234	Ustic Torriorthents-Badland complex, 10-100% slopes	Moderate	Depth to rock	Poor	Depth to rock
240	Wibaux-Wibaux, thin solum complex, 6-40% slopes	Severe	Large stones, slope	Poor	Large stones
243	Wibaux, thick solum-Wibaux channery fine sandy loams, 3-40 % slopes	Severe	Large stones, slope	Poor / Fair	Large stones, slope
245	Wibaux-Shingle-Badland complex, 6-60% slopes	Severe	Large stones, slope, low strength	Poor	Large stones, slope, low strength, depth to rock

## **Methodology**

The soils in project area were studied and mapped to an Order 3 scale by the NRCS in 1972 and 1991. All soils information was derived in whole or part from the Natural Resource Conservation Service (NRCS) Web Soil Survey (USDA NRCS 2008a), NRCS Soil Data Mart (USDA NRCS 2008b), and the 2004 NRCS Soil Survey of Southern Campbell County, Wyoming (Westerman 1991). Site specific information was gathered using recent 1:14,000 scale color ortho-photography from 2010 through 2012 vegetation surveys and maps of the proposed disturbance area.

In addition, soils specialists reviewed Geographic Information Systems (GIS) files identifying unstable soil areas for the TBNG. Those files were provided by the USFS Douglas Ranger District. Potentially unstable soils within the TBNG have slopes of 25-40% and unstable soils have slopes greater than 40%. Both areas are generally considered as no surface occupancy areas for oil and gas development stipulations, although the application of those stipulations for non-oil and gas projects is unknown.

## **Environmental Consequences (Effects Analysis)**

### **Alternative 1: No Action**

Under the No Action alternative, the existing alignments of the Mackey County Road and the directly adjoining segment of the Temporary Reno Road will be retained, and no new road construction will occur. Mining will not occur under the approximately 6.1 miles of the existing Mackey County Road and 2.2 miles of existing Temporary Reno Road within the NARM permit area.

The No Action alternative will have no new impacts on soils in the project area.

### **Alternative 2: Proposed Action**

The total impacted acreage on NFS lands associated with this project is projected to be approximately 292.7 short-term acres and of that, 85.7 will be long-term acres. The 292.68 acres are considered short-term because they are associated with the construction of the road and will be reclaimed. Areas included in the short-term acreage will have no long-term detrimental impacts on soils due to planned reclamation management. The 85.67 acres are regarded as long-term because they include the new infrastructure and post-construction maintenance within the easement to be transferred to Campbell County. Long-term impacted areas exist entirely within the planned permanent transportation system and are not considered detrimentally impacted areas per Forest Service Handbook 2509.18.

As noted, no unstable mapping units were identified within the project area and no detrimental soil removal outside the project boundaries will result from the proposed project. Soil removal in any continuous area outside the project boundaries will not exceed 100 square feet, and the percentage of detrimentally compacted, eroded, and displaced land will not exceed 15% of the activity area (Forest Service Handbook 2509.18). The expected

percentage of detrimentally impacted soils is 0%. This is due to the exemption of all permanent transportation systems in the 15% ruling and because all short-term disturbances caused by construction will be reclaimed or mitigated. A possibility for detrimentally impacted soils occurs in areas where major cut operations are required on steep hill slopes, but the necessary precautions will be made to mitigate the potential erosion issues.

It is estimated that only approximately 0.5 mile of the Mackey Road Relocation will require any major cut/fill construction. Topsoil and suitable subsoil (as defined by WDEQ Land Quality Division Guideline #1 - Topsoil and Overburden) will be removed only from the disturbed area (cut/fill zones) within the corridor and replaced on the road and ditch slopes. After stripping of topsoil and subsoil to the intended grade, the remaining subsoil will be compacted (if bedrock has not been reached) prior to the laying of road foundation. In areas where hills are cut through, the man-made channel will collect runoff rain water and soil fines. Both compaction of subsoil and natural increase in fines will lead to slower infiltration rates in the areas immediately to either side of the road. Soil disturbances will also extend outward to a distance sufficient enough to create an angle of incline smaller than the potential angle of repose.

Detrimental wind and water erosion may be experienced both in cut hill slopes and the area immediately surrounding the road if immediate steps are not taken to protect the soil (Shukla 2004). Any area of soil immediately below the road and foundation will be unavailable for any biological production. The area of soil from the edge of the road to the disturbed edge of any cut hillslopes will be mostly unavailable for sustained biological production, depending on ground cover type. Direct biological impacts to soil resources in the immediate area of construction activity would include short-term reduction in soil organic matter, microbial populations, seeds, bulbs, rhizomes, and live plant parts (Ingram 2005).

Assuming that heavy machinery operation will be limited to current roads and the planned disturbance area, the impact to soils not being directly disturbed will be insignificant. The net long-term soil loss should only be from two sources. These sources are the soil contained underneath the new road, and any erosional losses caused during the construction process prior to implementation of permanent management plans. Any disturbances, whether from compaction by machinery or in areas of cut or fill, will not cause long-term detrimental impacts due to planned reclamation efforts.

Steep slopes are an issue in T42N, R69W, NE¼ Section 7 and SE¼ Section 6. The construction corridor in these sections will be 700 feet wide; necessary precautions mentioned in this section will be undertaken to ensure limited disturbance and erosion.

Impacts on soils during construction will be minimized by numerous practices. Construction and maintenance vehicles will use existing highways, county roads, dirt roads, and the proposed construction right-of-way corridor to access and travel within the project area. Any yard area needed for temporary storage of construction materials or equipment staging areas will be located within the project area or on privately-owned or leased surface. Areas of soil next to the road that are not cut into hillsides can be reclaimed to original production levels.

Potential for erosion can be mitigated by providing ground cover. It is recommended to avoid major reshape work during certain times in the year when frequent and heavy rainfall can be expected. A geo-grid-type stabilization material may be used under the base course or within the cut/fill zone in areas where stability of the sub-base might be of concern. Slopes will be designed to minimize erosion potential by employing a combination of currently accepted standard practices such as slope angle reduction, re-application of topsoil, re-vegetation with appropriate seed mixes designed to create the best cover, and, possibly, the use of mechanical runoff control features such as contour ditches, drop structures, etc. All ditches and drainage structures will be designed and constructed to provide satisfactory control of surface drainage. Slope angle in ditches will be reduced to the extent possible to control drainage velocity and will probably need to be supplemented with mechanical control devices such as rip-rap (or other rock armoring), geo-web filled with rock or concrete, drainage culvert armoring and slope paving, check dams, and so on. Engineered drainage structures consisting of multiple corrugated metal pipe or concrete box culverts will be installed during low flow to maintain post-construction habitat connectivity and prevent down-cutting and head-cutting where the road will cross Little Thunder Creek and School Creek.

A Stormwater Pollution Prevention Plan permit will be obtained by the construction contractor and will remain in force until the construction area has been adequately re-vegetated and the slopes and ditches fully stabilized. This will help prevent sedimentation of wetlands by erosion. In addition, the prime contractor will be required to provide a one year warranty to Campbell County against any construction deficiencies.

The success of the nearby mine reclamation demonstrates that natural vegetation production and cover can be returned to acceptable and/or near natural amounts through proper reclamation practices. However, it is important to monitor and control noxious weeds during revegetation, as they may impact soil productivity.

### **Cumulative Effects for the Proposed Action Alternative**

Under the Proposed action, the following cumulative effects to the soil resource are possible:

- Increased wind and water erosion (Shukla 2004)
- Degradation of suitable salvaged material to be used for reclamation (Bendfeldt 2001, Ingram 2005, Shukla 2005, Zipper 2011).

Additional incremental loss of soil resources will occur in the general vicinity as operations at nearby coal mines encroach into existing approved disturbance areas, with some soil being taken out of production in those areas until reclamation is established. Other impacts have already occurred and will continue to occur from mineral extraction processes such as oil and gas (conventional and CBNG) exploration and development, and their associated infrastructure. Conventional oil and gas development, ranching, and recreational activities are expected to contribute minimally to cumulative impacts to soil resources due to the relatively limited nature and/or scope of those activities.

The application of Grassland Plan Standard and Guidelines, appropriate project design criterion, and existing monitoring and mitigation measures required for development of federal coal minerals, and oil and gas reserves in the cumulative impact analysis area for the proposed project can effectively protect existing soil resources on federal surface. The use of sufficient effective total vegetation cover and man-made erosion control devices both during and after construction also can minimize or preclude erosion and other related problems. Proper salvage and protection of topsoil and suitable subsoil during construction will minimize cumulative impacts on seedbed material quality. Overall, cumulative effects are not expected to cause insurmountable impacts on the soil resource.

### **Determination of Effects and Rationale**

The No Action alternative will have **no impact** on soils resources in the project area.

The Proposed Action will have **no impact** on unstable mapping units and **no detrimental soil removal** outside the project boundaries. The percentage of detrimentally compacted, eroded, and displaced land **will not exceed 15%** of the activity area. The Proposed Action **will impact** limited quantities of potentially unstable and hydric soils, but those impacts will be minimized by the use of appropriate best management practices for erosion control, soil compaction, and revegetation.

### **Short-Term Use/Long-Term Productivity, Unavoidable Adverse Impacts, Irreversible or Irretrievable Commitments of Resources for Cultural Resources**

No loss in long-term productivity is expected under either alternative.

No unavoidable adverse effects are expected under either alternative.

The character of the area will not be changed by either alternative. No irreversible or irretrievable impacts on soils resources will occur under either alternative.

## **3.7 Hydrology**

### **Existing Conditions**

#### **Ground Water**

The general Mackey Road area contains three water-bearing geologic units: the recent alluvial deposits, Wasatch Formation overburden, and the Wyodak or Wyodak-Anderson coal seam (in descending order). The underlying, sub-coal Fort Union Formation and the Lance Formation-Fox Hills Sandstone aquifer serve as a water supply for existing coal mines within the Mackey Road area. However, no groundwater disturbance is expected from surface construction of Mackey Road. Detailed information describing regional and site-specific baseline hydrogeologic environments for the project area and immediate vicinity is available in the NARM and School Creek Mine WDEQ mine permits, on file with WDEQ in Sheridan or Cheyenne, Wyoming, as well as the Wright Area Coal LBA Final EIS, available from the BLM High Plains District Office in Casper, Wyoming.

The alluvial aquifer for recent deposits in Little Thunder receives recharge from three primary sources: the infiltration of precipitation; lateral movement of groundwater that discharges from the adjacent Wasatch Formation overburden; and infiltration of surface flow within the stream channel. The quality of alluvial groundwater in Little Thunder Creek is suitable for livestock and wildlife use, but the concentration of sulfate typically exceeds the agricultural use standard.

The Wasatch Formation is recharged from the infiltration of precipitation and surface water stored in playas and in-channel reservoirs, and from lateral movement of water from adjacent scoria bodies. Groundwater is typically discharged from the formation by evaporation and transpiration, pumping wells, drainage into mine excavations, and seepage into the alluvium along stream courses. Groundwater movement through the formation typically follows the topography of the area, with low overall hydraulic conductivity and low flow rates. Because the water-bearing units within this formation are not continuous, the Wasatch Formation is not considered as a regional aquifer. The quality of groundwater in the Wasatch Formation is highly variable and generally poor. This formation provides limited groundwater for livestock and domestic uses on a local scale, provided the water quality is suitable.

The Wyodak coal seam is considered a regional aquifer because it is water-bearing and laterally continuous throughout the area. The hydraulic conductivity within this coal seam is highly variable; recharge occurs primarily through infiltration of precipitation. In general, groundwater flows from east to west, following the natural dip of the coal seam deeper underground as it moves west from the PRB. Monitoring conducted by local coal mines over the last 25 years indicates that groundwater levels and flow directions in the Wyodak coal seam have been greatly influenced (i.e., decreasing) by surface mine dewatering and groundwater discharge associated with CBNG development (Wright Area Coal LBA Final Environmental Impact Statement 2010). Groundwater from coal seams is typically suitable only for livestock and wildlife because concentrations of certain substances often exceed many suitability criteria for domestic uses. The water also may have high salinity and sodium levels that make it unsuitable for agricultural uses.

### **Surface Water**

The Mackey Road Relocation project area is primarily located in the Cheyenne River Basin watershed. Little Thunder Creek and one of its tributaries, School Creek, provide the main surface drainage within the Mackey Road Relocation project area (Appendix 1, Map 1). Little Thunder Creek drains into Black Thunder Creek, a major tributary of the Cheyenne River. The relocated Mackey Road crosses Little Thunder Creek in T43N, R69W, NESE Section 30, and crosses School Creek in T43N, R69W, SESE Section 31. Engineered drainage structures consisting of multiple corrugated metal pipe or concrete box culverts will be installed to maintain post-construction habitat connectivity and prevent down-cutting and head-cutting where the road will cross Little Thunder Creek and School Creek. No other diversions or other impacts to streams or other bodies of water are anticipated.

Little Thunder Creek and all of its tributaries are ephemeral. The creek is recharged primarily from convective thunderstorm runoff and, to a lesser extent, snowmelt runoff in the spring.

Like most streams in the area, Little Thunder Creek also receives CBNG discharge water. Despite the additional water influx, mean annual rates of stream flow and discharge volume in the channel have remained relatively unchanged in recent years due to an extended drought period in the PRB since 1999. The WDEQ has classified Little Thunder Creek downstream of its confluence with North Prong Little Thunder Creek as a 2ABww stream that is protected for drinking water, aquatic life (a “ww” notation indicates a warm water fishery), recreation, wildlife, agriculture, industry and scenic value. Class 2AB waters are those known to support game fish populations at least seasonally and unless shown otherwise, are presumed to have sufficient water quantity and quality to support drinking water supplies and are protected for that use. School Creek is classified as Class 3B (non-drinking water/non-fish supporting).

### **Alluvial Valley Floors**

Alluvial valley floors (AVF) are defined in WDEQ regulations as unconsolidated stream-laid deposits where water availability is sufficient for sub-irrigation or flood irrigation agricultural activities. The identification of AVFs requires detailed studies of the geomorphology, soils, hydrology, vegetation, and land use. For any designated AVF, regardless of its significance to agriculture, it must be demonstrated that the essential hydrologic functions will be protected. Investigations have been conducted in the area of the Mackey Road Relocation project by various mining companies. A significant AVF was identified near the confluence of North Prong Little Thunder Creek and Little Thunder Creek. Additionally, the portion of School Creek in T42N, R69W, Section 7 and T42N, R70W, Section 12 was identified as an AVF. Construction activities associated with the Mackey Road relocation are located several miles from these AVF's and no impact to them is anticipated.

### **Wetlands**

Wetlands are aquatic features characterized by three specific components: hydric soils, a dominance of hydrophytic plants, and wetland hydrology. These areas are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a vegetation community typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. These sites are typically highly productive and diverse, and provide habitat for many wildlife species. Wetlands play an important role in controlling floodwaters, recharging groundwater, and filtering pollutants (Niering 1985).

Field observations were conducted within the wetlands analysis area (proposed road corridor and a 1,000-foot buffer; 500 feet either side of center) on June 2 and 6, 2011 and May 22, 2012 to assess all potential wetland areas within the analysis area. The survey spanned two years to accommodate the reroute of the southern end of the alignment in 2012. Surveys included creeks, drainages, reservoirs, playas, and depressional areas for indications of wetland hydrology, a dominance of hydrophytic vegetation, and the presence of hydric soils. All potential wetland areas throughout the entire analysis area were visually inspected for indications of wetland hydrology and hydrophytic vegetation while intrusive sampling was conducted to determine occurrence of hydric soils for analysis of wetland occurrence.

Wetlands identified in the analysis area are listed in Table 3-14. Wetlands (areas meeting all three parameters) occurred in School Creek, Little Thunder Creek, three playas, two reservoir

areas, and in isolated depressional areas in unnamed, vegetated, dry ephemeral drainages. A total of approximately 6.6 non-contiguous acres of wetlands are present in the Mackey Road project area: 0.5 acre of Palustrine Aquatic Bed (PAB); 1.5 acres of Palustrine Emergent (PEM) Marsh; and 4.6 acres of PEM Wet Meadow. Approximately 3.99 non-contiguous acres of wetlands were delineated on NFS lands within the Mackey Road analysis area (right-of-way and 1,000-foot buffer). No Other Waters of the U.S. (OWUS) were identified; channels not identified as wetlands consisted of vegetated channels lacking ordinary high water marks. Jurisdictional determination lies with the United States Army Corp of Engineers (USACOE). That agency determined that Little Thunder Creek and adjacent wetlands are the only waters of the United States within the Mackey Road Relocation corridor (USACOE letter dated October 17, 2012). Those wetlands are on private surface at the northern end of the analysis area.

## **Environmental Consequences (Effects Analysis)**

### **Alternative 1: No Action**

Under the No Action alternative, the existing alignments of the Mackey County Road and the directly adjoining segment of the Temporary Reno Road will be retained, and no new road construction will occur. Mining will not occur under the approximately 6.1 miles of the existing Mackey County Road and 2.2 miles of existing Temporary Reno Road within the NARM permit area.

The No Action alternative will have no new impact on existing water resources, AVFs, or wetlands in the Mackey Road Relocation analysis area.

### **Alternative 2: Proposed Action**

The Proposed Action will have no impact on ground water or AVF resources. This action will have a minor, temporary impact on surface water resources and a moderate, permanent impact on approximately 1.4 acres of jurisdictional wetlands associated with Little Thunder Creek. That portion of Little Thunder Creek is on private surface.

Installation of culverts will occur during low flow to minimize impacts to surface water. All wetland functions will be lost in areas disturbed during construction activities. These impacts will be mitigated during reclamation by creating equivalent acreages of wetlands elsewhere in the Mackey Road Relocation area or within the NARM permit area. Determination of the jurisdictional wetland acreage to be affected and construction drawings for mitigation areas will be prepared as part of the Nationwide Permit 14 application and approval process, as needed.

Soil erosion and runoff are expected during construction. The use of appropriate best management practices, as needed, will minimize the potential for such impacts. Engineered drainage structures consisting of multiple corrugated metal pipe or concrete box culverts will be installed during low flow to maintain post-construction habitat connectivity and prevent down-cutting and head-cutting where the road will cross Little Thunder Creek and School



Creek. No other diversions or other impacts to streams or other bodies of water are anticipated. An increase in noxious and invasive weed species occurrence due to increased traffic and soil disturbance within the project area is expected. The increase in noxious weeds could impact the wetland plant communities. However, during construction, control of

Table 3-14. Summary of Waters of the U.S. Classifications in the PPRM Mackey Road Relocation analysis area.

Feature ID	Cowardin Classification				
	General Description	Palustrine			Total (acres)
		Aquatic Bed (PAB) (acres)	Emergent (PEM) Marsh (acres)	Emergent (PEM) Wet Meadow (acres)	
P1	Channel Depressional Area	---	---	0.011	0.011
P2-P5	Channel Depressional Areas	0.057	0.003	---	0.060
P8	Reservoir	0.042	0.007	0.086	0.135
P9	Channel Depressional Area	---	---	0.103	0.103
P10	Playa	0.151	0.061	0.413	0.625
P11	Channel Depressional Area	---	---	0.012	0.012
P12	Channel Depressional Area	---	---	0.088	0.088
10	Playa	0.010	---	1.557	1.567
11	Playa	0.009	---	1.472	1.481
14	Little Thunder Creek	0.020	0.380	0.418	0.818
15	Little Thunder Creek	---	0.500	0.122	0.622
17	Channel Depressional Area	0.002	---	---	0.002
18	School Creek	0.225	0.500	0.319	1.044
19	Reservoir Tail	---	0.038	0.031	0.069
Total (Acres)		0.516	1.489	4.632	6.637

--- Does not occur or is <0.001 acre.

noxious and invasive species would be performed by the contractor. After construction is complete, Campbell County would control noxious weeds.

### Cumulative Effects for the Proposed Action

No new cumulative impacts will affect groundwater, AVF, or jurisdictional wetland resources on NFS lands in the area due to their physical characteristics or absence from the area.

Existing activities on roads within the project area may result in minor sedimentation or runoff into surface water within Little Thunder Creek at the existing crossing on private surface. Existing activities also could introduce noxious weeds into the existing area or new road corridor, which could affect wetland resources. Reclamation activities outside the final road corridor will be done using best management practices and per USFS regulations and requirements.

Under the Proposed Action, approximately 1.4 acres of jurisdictional wetlands will be impacted by road construction activities; that disturbance will occur on private surface. A Nationwide 14 Permit Application will be prepared in response to these impacts and PPRM will mitigate all affected jurisdictional wetlands in accordance with section 404 of the Clean Water Act.

Mitigation is required at a minimum one-to-one ratio for jurisdictional wetlands. The wetland replacement plan, which must be approved by the USACOE, requires no net loss of wetland area and function.

### **Determination of Effects and Rationale**

The No Action alternative would have **no effect** on water, AVF, or wetland resources in the project area.

Implementation of the Proposed Action will result in **moderate, permanent impacts** to potentially jurisdictional wetlands on private surface in the analysis area. Replaced wetlands (jurisdictional or functional) may not duplicate the exact function and landscape features of the pre-disturbance wetlands, but all wetland replacement plans will be approved by the USACOE, which has special required permitting procedures to assure that no net loss of wetlands will occur after reclamation.

### **Short-Term Use/Long-Term Productivity, Unavoidable Adverse Impacts, Irreversible or Irretrievable Commitments of Resources for Cultural Resources**

No loss in long-term productivity is expected under either alternative.

No unavoidable adverse effects are expected under either alternative.

The character of the area will not be changed by either alternative. No irreversible or irretrievable impacts on hydrological resources will occur under either alternative.

## **3.8 Land Use**

### **Existing Conditions**

The Mackey Road Relocation project area includes a mix of private, state, and federal lands. Livestock grazing (sheep and cattle) on native rangeland is currently the primary land use in the project area itself. Secondary uses on all lands include oil and gas production (conventional and CBNG), wildlife habitat, communication and power lines, transportation (road and rail), and recreation (mainly big game hunting). No fisheries are present and no

public fishing opportunities are available in the Mackey Road Relocation project area or surrounding area. Surface mining and its related infrastructure are present immediately west of the project area, and will continue to move north and west. The existing alignment of the Mackey Road through the NARM permit area allows access to NFS, state, and private lands in the general project area from the west, but access to the project area itself is quite limited at present. This relative isolation provides a somewhat secluded setting for hunting, hiking, and other recreational activities, though mine operations are visible and/or audible from much of the project area.

## **Environmental Consequences (Effects Analysis)**

### **Alternative 1: No Action**

Under the No Action alternative, the existing alignments of the Mackey County Road and the directly adjoining segment of the Temporary Reno Road will be retained, and no new road construction will occur. Mining will not occur under the approximately 6.1 miles of the existing Mackey County Road and 2.2 miles of existing Temporary Reno Road within the NARM permit area.

The No Action alternative will have no new impact on existing land uses in the Mackey Road Relocation analysis area.

### **Alternative 2: Proposed Action**

The Proposed Action will have limited impacts on existing land uses in the project area. The primary land use (agricultural) may experience a minor (85.7 acres, long-term) reduction in grazing habitat due to the new alignment. However, coordination with grazing permittees post-construction will ensure optimum placement of fences and gates to maintain logical grazing pasture delineations, water availability, and general access in the area. The improved road conditions also may allow ranchers to transport their livestock more easily than on current two-track roads. The USFS estimates a loss of approximately 14 animal unit months, which it does not consider burdensome. Hunting and hunting access will be permanently affected as the new county road is expected to provide easier motorized access to some public lands within the TBNG not currently readily accessible to the general public except by hiking into the area. Some hunters will like the easier access, though others may be disappointed that previously remote areas will have an upgraded road dissecting the landscape. Activities near road segments to be vacated are ongoing, and procedures are currently in place to address displaced activities such as grazing, wildlife use, and other non-mine energy operations.

### **Cumulative Effects for the Proposed Action**

Cumulative impacts will occur under the Proposed Action due to the construction of a new county road where none currently exists, with reconstruction of a small portion of an existing county road in the northern portion of the project area. The Proposed Action will result in approximately 292.7 additional acres of short-term surface disturbance on NFS lands during construction, and approximately 85.7 additional acres of permanent disturbance upon

completion and transfer of the road easement to Campbell County. However, that acreage is not considered a major influence when compared to existing approved and/or permitted activities. Access to existing land and infrastructure would be greatest under the Proposed Action. The project area falls entirely outside current and projected permit areas for nearby surface coal mines, thus providing a safer route through the area by avoiding areas where blasting, heavy equipment traffic, and other mine hazards regularly occur. Only approximately 14 animal unit months will be affected under the Proposed Action; the project will maintain and/or improve accessibility to pastures and water. Due to the nature of the proposed disturbance, the maintenance of public access within the general area, and the improved public safety under the Proposed Action, any impacts to grazing permits (forage, changes in allotments, etc.) or other land use aspects will be offset by the potential benefits. However, recreationalists seeking remote experiences will lose that opportunity to some extent due to the likely increase in traffic, noise, and dust that will accompany the finished road.

### **Determination of Effects and Rationale**

The No Action alternative will have **no impact** on land use in the project area.

The Proposed Action will result in **minor, permanent impacts** on grazing operations (beneficial and detrimental), **moderate, permanent beneficial impacts** on public safety by avoiding active mine areas, and **moderate, permanent impacts** to unbroken landscapes sought by some recreationalists.

### **Short-Term Use/Long-Term Productivity, Unavoidable Adverse Impacts, Irreversible or Irretrievable Commitments of Resources for Cultural Resources**

No loss in long-term productivity is expected under either alternative.

No unavoidable adverse effects are expected under either alternative.

The character of the area will be changed somewhat by the Proposed Action. However, no irreversible or irretrievable impacts on land use will occur under either alternative.

## **3.9 Air Quality**

### **Background**

The WDEQ administers a permitting program to assist the agency in managing the state's air resources. Under this program, anyone planning to construct, modify, or use a facility capable of emitting designated pollutants into the atmosphere must obtain an air quality permit to construct. Coal mines fall into this category. The WDEQ also requires annual monitoring data to document the air quality at all of the PRB coal mines. As a result, the eastern PRB is one of the most intensely monitored areas in the world. The most recent detailed descriptions of factors affecting air quality, the regulatory standards for various aspects of air quality monitoring at surface coal mines in the southern PRB, long-term monitoring results, and existing and likely future impacts to air quality variables are provided in the Wright Area Coal LBA Final EIS, available from the BLM High Plains District Office

in Casper, Wyoming. An additional supplemental information report was completed to follow up on the impacts of air quality after the Wright Area Coal LBA FEIS to confirm that there would not be any exceedances caused by the lease tracts and coal mining. The analyses performed and impacts discussed in that final EIS encompass the project area due to its overlap with LBA tracts for NARM. A summary of relevant factors for the Proposed Action and No Action alternative for this document is provided below.

## **Existing Conditions**

Livestock grazing is the primary land use in the general project area, though surface coal mining occurs at multiple properties just west of the project area. Other land uses include oil and gas production (conventional and CBNG), wildlife habitat, power and communication lines, transportation (road and rail), and recreation (mainly big game hunting outside the permit areas). Those activities occur on all surface ownership.

Air pollution impacts are limited by various local, state, tribal, and federal air quality regulations, standards, and implementation plans. In Wyoming, air pollution impacts are managed by WDEQ's Air Quality Division (AQD) under the Wyoming Air Quality Standards and Regulations and the Environmental Protection Agency-approved state implementation plan. WDEQ/AQD requires monitoring data to document the air quality at all of the PRB mines. Full details regarding air quality and associated regulations applicable to surface coal mining are available from the AQD and in the Wright Area Coal LBA Final EIS. Permit information specific to NARM is available from the WDEQ in Cheyenne, Wyoming.

Various factors influence the air quality of any region, including the magnitude and distribution of pollutant emissions, the regional climate (including prevailing wind direction), and the local topography. The Mackey Road relocation project is located beyond and east of the NARM permit area, in the east-central portion of the PRB, a part of the Northern Great Plains that includes most of northeastern Wyoming. As discussed previously, the topography in the project area is primarily rolling plains with limited areas of rougher terrain. The climate is semiarid, with relatively short warm summers and longer cold winters. Evaporation exceeds annual precipitation.

Air quality conditions in rural areas often are better than in large urban/industrial centers. Rural areas typically have a smaller number of emission sources and favorable atmospheric dispersion conditions which can result in relatively low air pollutant concentrations.

Fugitive dust particles are generated from a variety of mine-related operations and natural sources including, but not limited to, blasting, excavating, hauling, and similar activities, as well as wind erosion of disturbed and un-reclaimed mining areas. Large mining equipment produces particulate and gaseous tailpipe emissions that impact air quality downwind. Coal crushing, storage, and handling facilities are the most common stationary or point sources associated with surface coal mining and preparation.

Blasting occasionally produces gaseous, orange-colored clouds that contain nitrogen dioxide; these clouds result from the incomplete combustion of explosives used in the blasting process. Other types of air pollutant emission sources within the project area include:

- Nitrogen dioxide and particulate emissions from railroad locomotives;
- Carbon monoxide and nitrogen oxides from internal combustion engines used at natural gas and CBNG pipeline compressor stations;
- Carbon monoxide, nitrogen oxides, particulates, sulfur dioxide, and volatile organic compounds from gasoline and diesel vehicle tailpipe emissions;
- Particulate matter (dust) generated by vehicle travel on unpaved graded roads, agricultural activities such as plowing, and paved road sanding during the winter months; and
- Windblown dust and air pollutants transported from emission sources located outside the PRB.

Visibility is another component of air quality, and can be defined as the distance one can see and the ability to perceive color, contrast, and detail at great distances. Visual range (the farthest distance a person can see a landscape feature) is most often impaired by fine particulate matter suspended in the air due to natural (wind) or man-made surface disturbance.

### **Emission Sources**

The PRB Coal Review generally considers existing air quality conditions at the coal mines and immediate region (including the project area east of the mines) to be very good. Due to its location east of the mines, the general area itself has limited air pollution emissions sources (e.g., industrial facilities, including the surface coal mines, and few residential emissions in relatively small communities and isolated ranches) and good atmospheric dispersion conditions.

Oxides of nitrogen (NO<sub>x</sub>) include nitrogen dioxide (NO<sub>2</sub>), nitrous acid (HNO<sub>2</sub>), and nitric acid (HNO<sub>3</sub>). The National Ambient Air Quality Standards (NAAQS) include NO<sub>2</sub>, a component of NO<sub>x</sub>. The available data show that the PRB complies with the ambient air quality standards for NO<sub>2</sub>. Occasional high concentrations of carbon monoxide (CO) and particulate matter may occur in more urbanized areas (e.g., cities of Gillette, Sheridan, and Buffalo) and around industrial facilities (e.g., surface coal mines and coal-fired power plants), especially under stable atmospheric conditions that occasionally occur during winter.

The primary direct source of gaseous emissions from surface coal mining operations is tailpipe exhaust from large mining equipment and other vehicle traffic inside the mine permit area. Additional sources of NO<sub>x</sub> include blasting (overburden and coal) and emissions from the trains used to transport the coal away from the mine.

Under the Clean Air Act, the EPA has set protective health-based standards for ozone. Ground level ozone (O<sub>3</sub>) is not emitted directly into the air, but is a secondary pollutant created by chemical reactions between oxides of nitrogen (NO<sub>x</sub>) and volatile organic compounds (VOC) in the presence of sunlight. Emissions from industrial facilities, electric

utilities, motor vehicle exhaust, gasoline vapors, and chemical solvents are some of the major sources of NO<sub>x</sub> and VOC.

The WDEQ does not currently require O<sub>3</sub> monitoring at PRB coal mines, but has monitored levels at its ambient air quality monitoring sites in the PRB since 2001. During this period, no exceedances of the O<sub>3</sub> standard have occurred at any of these monitoring sites.

### **Particulate Emissions**

Particulate matter (PM) is a complex mixture of small particles and liquid droplets that are suspended in the air. PM is made up of a number of components, including acids (nitrates and sulfates), organic chemicals, metals, and soil or dust particles. Fine particulates are those measuring 2.5 micrometers or less in diameter (PM<sub>2.5</sub>). They are also a major cause of visibility impairment in many parts of the United States. While individual particles cannot be seen with the naked eye, with sufficiently high concentrations, they can appear as black soot, dust clouds, or haze.

Surface coal mining activities generate fugitive dust particulates and gaseous tailpipe emissions from large mining equipment. Specifically, activities such as blasting, excavating, loading and hauling of overburden and coal, and wind erosion of disturbed and unreclaimed mining areas produce fugitive dust. Coal crushing, storage, and handling facilities are the most common stationary or point sources for particulate matter associated with surface coal mining and preparation.

Historical data for particulate matter from monitoring efforts (i.e., NARM and other neighboring mines) that overlap the Mackey Road Relocation analysis area generally show the same results as for the PRB as a whole. No monitored exceedances of the annual standard for PM<sub>10</sub> or PM<sub>2.5</sub> have occurred at NARM, to date.

### **Visibility**

Visibility refers to the clarity with which scenic vistas and landscape features are perceived at great distances. That is, visibility can be defined as the distance one can see and the ability to perceive color, contrast, and detail. Fine particulate matter (PM<sub>2.5</sub>) can be one of the primary causes of visibility impairment. Visual range, one of several ways to express visibility, is the farthest distance a person can see a landscape feature. Pristine visual range is estimated to be about 140 miles in the western U.S. and 90 miles in the eastern U.S., without the impacts of human activity (EPA 2001).

Visibility impairment is expressed in terms of deciview (dv). The dv index was developed as a linear perceived visual change (Pitchford and Malm 1994) and is the unit of measure used in the EPA's Regional Haze Rule to achieve the National Visibility Goal. The goal was established as part of the Clean Air Act in order to prevent any future, and remedy any existing, impairment of visibility in mandatory Federal Class I areas that result from manmade air pollution. The dv index is a scale related to visual perception that has a value near zero for a pristine atmosphere. A change in visibility of 1.0 dv represents a "just

noticeable change” by an average person under most circumstances. Increasing dv values represent proportionately larger perceived visibility impairment.

### **Prevention of Significant Deterioration (PSD)**

Under requirements of the Clean Air Act, the EPA has established PSD rules that are intended to prevent deterioration of air quality. Increases in ambient concentrations of NO<sub>2</sub>, SO<sub>2</sub>, and PM<sub>10</sub> are limited to modest increments above the existing or “baseline” air quality in most attainment areas of the country (i.e., areas that have “attained” compliance with the adopted NAAQS for that pollutant). Increases in ambient concentrations of those pollutants are limited to very small incremental increases in pristine attainment areas.

For the purposes of PSD, the EPA has categorized each attainment area in the U.S. into one of three area classifications. PSD Class I is the most restrictive air quality category and applies to national parks and other federally designated areas. These Class I areas are “mandatory” in that they cannot be redesignated. Attainment areas defined as Class I at the request of a state or tribe (e.g., Northern Cheyenne Reservation) are considered “designated” Class I areas; this category is intended to protect air quality in areas of particular interest to the requesting entity. Designated Class I areas can be redesignated at the option of the requesting state or tribe. All remaining areas outside of mandatory or designated Class I boundaries are classified as Class II areas, which allow a relatively greater deterioration of air quality, although still within the NAAQS. No Class III areas, which would allow further degradation, have been defined.

The closest mandatory Class I areas to the Mackey Road Relocation analysis area are Wind Cave National Park and Badlands National Park in South Dakota, located about 90 miles and 140 miles east of the project area, respectively. The closest designated Class I area is the Northern Cheyenne Indian Reservation (in Montana), located about 135 miles north-northwest of the analysis area. The closest sensitive areas are the Class II Devils Tower National Monument (70 miles to the north-northeast) and Jewel Cave National Monument (74 miles to the east).

An initial inventory of all point sources, controls, and emissions for the adjacent NARM air quality permit shows a maximum potential to emit of 40.2 tons per year. That level is below the 100 tons per year major source threshold limit specified in Chapter 6, Section 3 of the Wyoming Air Quality Standards and Regulations. Therefore, a PSD increment consumption analysis is not necessary for NARM, and the mine is not subject to PSD permitting. Further, surface coal mines are not considered to be major emitting facilities in accordance with Federal and state regulations (40 CFR 52.21, WDEQ Chapter 6, Section 4). Therefore, Wyoming does not require mines to evaluate project air quality impacts, including Air Quality Related Values (AQRV), on Class I areas.

### **Public Health and Safety**

Recent public health and safety concerns in the PRB have largely focused on the potential for exposure to particulate matter and NO<sub>x</sub> emissions from coal mining and related support activities (e.g., topsoil stripping), and the potential impacts of such exposures on the health of



people living in the vicinity of surface coal mines located in the eastern PRB. Potential health risks associated with inhalation of particulate matter and NO<sub>x</sub> include acute respiratory problems, aggravated asthma, decreases in lung capacity in some healthy adults, inflammation of lung tissue, respiratory-related hospital admissions and emergency room visits, and increased susceptibility to respiratory illnesses, including bronchitis and pneumonia. Public exposure to emissions caused by surface mining operations is most likely to occur sporadically along public roads and highways that pass by or through the area of mining operations.

Air pollution is controlled by state and federal air quality regulations and standards established under the federal Clean Air Act Amendments. All mines in the PRB are required to conduct air quality modeling to show that their proposed operations will comply with the state and national air quality standards, and they are also required to demonstrate through regular monitoring that their actual air emissions do not exceed those standards.

To date, no events of public exposure to NO<sub>2</sub> from blasting activities at the adjacent NARM have been reported. Therefore, the WDEQ has not required NARM to implement any specific measures to control or limit public exposure to NO<sub>2</sub> from blasting, although the mine has instituted voluntary blasting restrictions to avoid NO<sub>x</sub> impacts to the public. Because the Mackey Road Relocation project will have considerably smaller potential impacts than NARM, both during construction and upon project completion, no such measures are anticipated for this project.

### **Power Plants**

The use of the coal after it is mined is not determined at the time of leasing. However, the majority of the coal currently being mined in the Wyoming PRB is being used by coal-fired power plants to generate electricity for the United States. The mines in the southern PRB do not sell their coal to any local power plants.

Five coal-fired power plants are in the Wyoming PRB study area analyzed in recent BLM regional Task 1 and Task 2 analyses. Black Hills Power Corporation owns and operates the Neal Simpson Units 1 and 2 (21.7 megawatts [MW] and 80 MW, respectively), Wygen I and II (80 MW and 95 MW, respectively), and Wyodak (330 MW) power plants, all of which are located approximately 5.0 miles east of Gillette and approximately 56 miles north of the proposed Mackey Road Relocation project. An estimated 1,380 MW of new power plant production capacity is anticipated in the Task 2 study area by 2015.

### **Greenhouse Gas (GHG) Emissions and Global Climate Change**

Climate change refers to any distinct change in measures of climate lasting for a long period of time. In other words, “climate change” means major changes in temperature, rainfall, snow, or wind patterns lasting for decades or longer. Climate change can result from:

- natural factors, such as changes in the sun’s energy or slow changes in the earth’s orbit around the sun;
- natural processes within the climate system (e.g., changes in ocean circulation); and/or

- human activities that change the atmosphere's make-up (e.g., burning fossil fuels) and the land surface (e.g., cutting down forests, planting trees, building developments in cities and suburbs, etc.)  
[http://www.epa.gov/climatechange/downloads/Climate\\_Basics.pdf](http://www.epa.gov/climatechange/downloads/Climate_Basics.pdf), EPA-430-R08-016).

Climatic change analyses are comprised of several factors, including greenhouse gas (GHG) emissions, land use management practices, and other variables. Many GHGs occur naturally in the atmosphere, such as CO<sub>2</sub>, methane (including CBNG), water vapor, ozone, and N<sub>2</sub>O. Other GHGs are synthetic (i.e., man-made), such as chlorofluorocarbons, hydrofluorocarbons and perfluorocarbons, as well as sulfur hexafluoride. These GHGs are released into the atmosphere and prevent the escape of reflected solar radiation and heat from the earth's surface.

The EPA states, "Emissions of greenhouse gases are typically expressed in a common metric so that their impacts can be directly compared, as some gases are more potent (have a higher global warming potential) than others. The international standard practice is to express greenhouse gases in carbon dioxide (CO<sub>2</sub>) equivalents, or CO<sub>2</sub>e. Emissions of gases other than CO<sub>2</sub> are translated into CO<sub>2</sub>e using global warming potentials" (EPA 2005). GHGs are not currently regulated for emissions from minor sources such as surface coal mines.

Researchers are investigating opportunities for carbon sequestration, the process of carbon capture, separation, and storage or reuse, as a means to stabilize and reduce concentrations of CO<sub>2</sub>. Direct options for carbon sequestration would involve techniques to capture CO<sub>2</sub> at the source (e.g., power plant) before it enters the atmosphere. Captured CO<sub>2</sub> could then be used in other efforts such as enhanced oil recovery operations, for "value-added" sequestration. Indirect sequestration would involve developing methods to integrate fossil fuel production and use with terrestrial sequestration and enhanced ocean storage of carbon. No carbon sequestration projects currently exist in the Wyoming PRB. However, CO<sub>2</sub> is being injected underground for the purpose of enhanced oil recovery near in the Salt Creek area near the town of Midwest, Wyoming.

## **Environmental Consequences (Effects Analysis)**

### **Alternative 1: No Action**

Under the No Action alternative, the existing alignments of the Mackey County Road and the directly adjoining segment of the Temporary Reno Road will be retained, and no new road construction will occur. Mining will not occur under the approximately 6.1 miles of the existing Mackey County Road and 2.2 miles of existing Temporary Reno Road within the NARM permit area.

The No Action alternative will have no impact on NO<sub>x</sub>, O<sub>3</sub>, or PM<sub>10</sub> emissions within the project area, or on public health and safety related to such emissions.

## **Alternative 2: Proposed Action**

The Proposed Action will directly impact air quality within the project area through increased vehicular traffic during construction of the relocated roadway. Those impacts will be short-term (approximately 5 months) and will decrease greatly once construction is complete. The relocation of an existing road rather than construction of a new additional road will further minimize new impacts, as existing traffic will move from one area to another rather than utilize both roadways simultaneously. However, it is expected that overall traffic levels will increase somewhat upon completion of the project.

Although coal extraction will not occur as part of the proposed project, it is a logical outcome upon completion of the road. Therefore, the Proposed Action will indirectly impact CO<sub>2</sub> emissions, GHGs, and climate change. The potential carbon sink capacity within the project area will be temporarily diminished by new surface disturbance under the Proposed Action; upland areas affected by the relocation may not create the same type of carbon sink as previously existed upon completion of the project.

Several other factors combine to minimize and/or mitigate such potential impacts from the Proposed Action. For example, mine operations (including the number of vehicles, speed limits, dust and other particulate emissions, etc.) will not increase as a result of the proposed project, though the location both of mine activities and their resulting effects will change as mining progresses through the vacated road alignments. No occupied residences are present within the project area. In addition, relocation of Mackey Road will reduce the public's exposure to blasting emissions and heavy equipment operations by relocating the county road west, and well beyond, existing coal leases.

Rigorous dust control, monitoring, and reclamation standards required by existing mine permits will be applied during and after construction, which will minimize potentially harmful emissions and particulates and their impacts on visibility in the project area and surrounding lands. WDEQ regulations require seeding of all topsoil piles to minimize erosion from wind and water, further reducing negative impacts to air quality. Long-term modeling and short-term monitoring for the nearby NARM and other neighboring mines indicate that similar mine activities currently projected to occur after the road is relocated will comply with NAAQS and state standards. USFS Standards and Guidelines also will apply.

## **Cumulative Effects**

The project area falls entirely outside current and projected permit areas for nearby surface coal mines. The Proposed Action will result in approximately 292.7 acres of short-term surface disturbance on NFS lands during construction, and approximately 85.7 acres of permanent disturbance upon completion and transfer of the road easement to Campbell County. Existing public access to private, state, and NFS lands will be maintained, with improvements to health and safety of individuals traveling throughout the project area by removing exposure to mine operations that produce various emissions and particulates. Surface disturbance outside the proposed project area, but in the vicinity, will result mainly from expansion of existing surface coal mines. Additional impacts have already occurred and

will continue to occur from other mineral extraction processes, such as oil and gas (conventional and CBNG) exploration and development, and their associated infrastructure. The application of Grassland Plan Standard and Guidelines, appropriate project design criterion, and existing monitoring and mitigation measures required for development of federal coal minerals, and oil and gas reserves in the cumulative impact analysis area will effectively protect existing air quality resources on federal lands.

### **Determination of Effects and Rationale**

The No Action alternative will have **no effect** on air quality and related factors in the new project area.

The Proposed Action will result in **moderate, short-term impacts** to air quality and visual resources in the project area. Those impacts will be offset upon completion of the project when existing traffic shifts from the current alignment to the new alignment.

### **Short-Term Use/Long-Term Productivity, Unavoidable Adverse Impacts, Irreversible or Irretrievable Commitments of Resources for Cultural Resources**

No loss in long-term productivity is expected under either alternative.

No unavoidable adverse effects are expected under either alternative.

The character of the area will not be changed by either alternative. Therefore, no irreversible or irretrievable impacts on air quality will occur under either alternative.

## **3.9 Economic and Social Conditions**

The management of the TBNG has the potential to affect the local economies. People and economies are an important part of the ecosystem. Use of resources generate employment and income in the surrounding communities and counties, and generate revenues that are used to accomplish USFS objectives or are returned to the federal treasury.

This section summarizes the socioeconomic conditions and community resources in Campbell County, Wyoming, that make up the affected environment for socioeconomic resources. Specifically, this section addresses population, economic conditions, income, housing, local government facilities and services, and utilities. Further in-depth information for all socioeconomic conditions can be found in the Wright Area Coal LBA Final EIS, available from the BLM High Plains District Office in Casper, Wyoming.

### **Regulatory Framework**

The preparation of NEPA documents is guided by Council on Environmental Quality regulations for implementing NEPA (40 CFR 1500-1508). NEPA requires that consequences to the human environment be analyzed and disclosed. The extent to which these environmental factors are analyzed and discussed is related to the nature of public comments received during scoping. NEPA does not require a monetary benefit-cost analysis. If an

agency prepares an economic efficiency analysis, then one must be prepared and displayed for all alternatives (40 CFR 1502.23).

The Office of Management and Budget Circular A-94 promotes efficient resource use through well-informed decision-making by the federal government. It suggests agencies prepare an efficiency analysis as part of project decision-making. It prescribes present net value as the criterion for an efficiency analysis.

The development of coal mining and mineral extraction is guided by agency direction found in USFS Manual 2800. FSH 2809.15 guides analyses for mineral and geology resource extraction, and FSH 2709.11 guides Special Use application and authorization processing.

## **Existing Conditions**

### **Population**

The project area is located in southern Campbell County. The City of Gillette and the town of Wright are the primary population centers in the area. According to the 2010 census (most recent), Campbell County's population estimate was 46,133. Gillette accounts for approximately 63% of the county's residents. That estimate represents an increase of approximately 48% since 2000, making Campbell County the third largest county in the state (Campbell County Economic Development Corporation 2011).

### **Employment and Economic Conditions**

The major industries in Campbell County in 2010 were (in descending order): mining, the school district, the hospital, local government, mine support services, and retail. Table 3-15 presents a list of employment by employer for Campbell County in 2010 (Campbell County Economic Development Corporation 2011). Surface coal mining represents approximately 58% of the total employment and payroll in Campbell County, with Peabody Energy as the largest individual employer. Due to recent changes in the economy, the oil and gas industry has not been a major employer in the area for the last 3 years (2008-2010) (Campbell County Economic Development Corporation 2011).

The unemployment rate in Campbell County was 4.4% in the second quarter of 2011. That was one of the lowest rates in Wyoming, and was significantly lower than the average national rate of 9.1% (Campbell County Economic Development Corporation 2011).

### **Housing**

Approximately 61% of the PRB coal mining employees were estimated to live in Gillette and surrounding areas, according to a 2001 report on housing needs; 14% were estimated to live in Wright and 25% were outside Campbell County (Pederson Planning Consultants 2001). Population growth since 2000 has prompted new housing construction in the region. During one recent period, construction did not keep pace with demand. Consequently, vacancy rates were at near record lows and housing prices have climbed in recent years (e.g., since 2005). Vacancy rates for rental units declined even more sharply than for homeowner units as a result of recent population growth. The lowest rental vacancy rate estimate in Campbell County in recent years was 0.4%. In 2009 (most recent data), Campbell County had a total of 15,015 housing units, 8.1% of which were vacant (U.S. Census Bureau 2009). Of the occupied housing units, 77% were owned and 23% were rented. Temporary housing

resources are available in the PRB in the form of hotel-motel rooms, private and public campgrounds, and vacant spaces in mobile home parks. In all, more than 70 lodging establishments with a total of more than 2,500 rooms are available in Gillette, Wright, and Douglas. Projected development in Campbell County indicates a strong demand for housing through 2020.

Table 3-15. Major employers in Campbell County in 2010.

Employer	Number of Employees	Percent of Employees
Peabody Energy	1,936	18%
Arch Coal	1,750	16%
Campbell County School District	1,659	15%
Cloud Peak Energy	1,588	14%
Campbell County Memorial Hospital	1,000	9%
Alpha Coal West	657	6%
Campbell County	623	6%
Wal-Mart	540	5%
City of Gillette	278	3%
Buckskin Mining Company	370	3%
Hettinger Welding	225	2%
L&H Industrial	200	2%
P&H Mine Pro Services	126	1%
<b>TOTAL EMPLOYEES</b>	<b>10,952</b>	<b>100%</b>

Source: Campbell County Economic Development Corporation (2011).

The average sale price of homes in Campbell County in 2007 was \$247,150. That represents a 23.6% increase over the average selling price in 2006, and the sixth highest rank among Wyoming counties (Wyoming Community Development Authority 2008). Monthly costs for hotels and other temporary housing rentals in the PRB, measured in the fourth quarter of 2006, were highest in Campbell County. By the second quarter of 2008, average apartment and housing rental costs ranged from \$318 to \$1,314 per month, depending on the size and structure of the rental property. In 2009, the median monthly housing cost for mortgaged homeowners was \$1,327 (U.S. Census Bureau 2009). For non-mortgaged homeowners and renters, that monthly cost was \$356 and \$762, respectively.

### **Environmental Justice**

Environmental justice relates to actions that unequally impact a given segment of society, whether as a result of physical location, perception, design, noise, or other factors. The

population of Campbell County and Wyoming for 2009 by race is displayed in Table 3-16. That year, the minority population in Campbell County was approximately 7.0% (U.S. Census Bureau 2009). By comparison, the minority population in Wyoming was 13%. In 2009, approximately 5.0% of the population of Campbell County was below the poverty level, compared with 9.6% of individuals in Wyoming, as a whole.

Table 3-16. 2009 population by race for Campbell County and Wyoming.

Race	Campbell County	Wyoming <sup>1</sup>
Total Population	40,290	523,949
Caucasian	93.3%	455,152 (87%)
Hispanic or Latino Origin	5.3%	39,783 (8%)
American Indian and Alaskan Native	1.0%	10,662 (2%)
Black or African American	0.6%	4,634 (0.9%)

Source: U.S. Census Bureau, 2005-2009 American Community Survey 5-year estimates (2009).

<sup>1</sup>Wyoming data provided for races also present in Campbell County: Margin of error +/- 0.1-0.2

Executive Order 12898, titled “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” was signed by President Clinton in early 1994 and requires federal agencies to identify and address disproportionately high and adverse human health or environmental effects of federal programs, policies, and activities on minority and low-income populations, including Native American tribes and populations. The Order requires the USFS to ensure effective public notification and access to information about proposed actions, to work to gain public participation in the analysis and decision processes, and to mitigate such effects if they could occur.

Public scoping for the Mackey Road project area included all local landowners and the general public (refer to complete scoping list in Chapter 4). All persons were contacted directly or otherwise made aware of the proposal. Participation was solicited from local landowners, representatives of county and tribal interests, and the general public in a manner consistent with USFS, agency, and departmental regulations and policy, and with government-to-government relationships between the United States and tribal governments.

### **Local Government Facilities, Services, and Utilities**

The City of Gillette provides a wide array of governmental services including law enforcement, fire protection, road and bridge infrastructure, solid waste disposal, medical and ambulance, public libraries, and education. Schools, churches, shopping centers, and other services are located throughout the city. Numerous cultural and recreation opportunities also are available within the Gillette area, including public golf courses, public swimming pools, public parks, ball fields, recreation centers, civic center, and a museum. The Town of Wright provides many of the same facilities and services as the City of Gillette. The 1,000-acre CAM-PLEX Multi-Events Facilities in Gillette feature a performing arts theater, a convention and exhibit hall, two large multipurpose pavilions, rodeo grounds, recreational vehicle campgrounds, a horse race track, and a 21-acre park and picnic area.

The public facilities and services, particularly the infrastructure, adequately serve the existing population and could support future growth. The City of Gillette provides residents and businesses with electric, water, sewer, and sanitation service. The town of Wright provides water, sewer, and sanitation services. Powder River Energy Corporation provides electric service to all areas of the county outside the Gillette city limits. KN Energy provides natural gas to the City of Gillette, Town of Wright, and some county residents. MGTC, a subsidiary of Western Gas Resources, also serves some residential and industrial natural gas customers in the county.

## **Environmental Consequences (Effects Analysis)**

### **Alternative 1: No Action**

Under the No Action alternative, the existing alignments of the Mackey County Road and the directly adjoining segment of the Temporary Reno Road will be retained, and no new road construction will occur. Mining will not occur under the approximately 6.1 miles of the existing Mackey County Road and 2.2 miles of existing Temporary Reno Road within the NARM permit area.

The No Action alternative would have no impact on management in the project area, but will impact social and economic resources in the region. This alternative excludes mining the coal beneath, or associated with, the proposed vacated road alignment. The main factor here is the loss of federal and state revenues of up to \$586,000,000.00. In addition, the loss of mining opportunities (jobs, housing, services, etc.), due to the lack of access to additional coal reserves associated with the proposed project, could impact the local population and possibly even the regional economy, in the long term. This alternative also is likely to affect local businesses, both directly and indirectly associated with local coal mines. Some people may lose jobs, and the opportunity for added job openings will be lost.

### **Alternative 2: Proposed Action**

The Proposed Action will have no impact on current local homeowners or renters. The primary purpose of the project is relocate an existing county road to maintain public access to the general area and facilitate recovery of coal reserves within previously permitted mine operations. The Proposed Action would benefit the local economy by contributing to ongoing operations that will extend the life of the mine. The main factor here is the gain of federal and state revenues of up to \$586,000,000.00. Existing jobs will be maintained and additional jobs may become available as mine operations progress through the project area, thereby affecting local businesses. Furthermore, the Proposed Action also would add monetary benefits to the county, which in turn could feed programs that benefit the quality of life throughout local communities. The Proposed Action also would have a positive impact on local social systems by helping to maintain current programs and facilities.

After examining the possible environmental and human impacts of the Proposed Action, the Interdisciplinary Team and Douglas Forest Supervisor determined that no disproportionately high or adverse human health or environmental effects would occur to minority or low



income groups, or American Indian tribes, and that the public involvement efforts undertaken by the Interdisciplinary Team were adequate to have identified such groups if they exist, or had an interest in the project. Therefore, the Douglas Forest Supervisor's determination is that approving the Mackey Road Relocation project area would not result in disproportional social or economic adverse impacts to these groups. The Forest Supervisor also has determined that equal access opportunity for minorities and people with disabilities would be maintained at a level at or above that which is presently found to exist within the project analysis area. It is highly unlikely that a reduction in public use of NFS lands in that area by such persons or groups as a result of the implementation of the proposed project would occur due to the maintenance of public access afforded by the proposed project.

### **Cumulative Effects**

Cumulative effects on economic and social systems are hard to quantify. Mining of coal reserves is an important part of TBNG activities and local economies. Social systems tend to change with or without any action on the part of the USFS. Implementing the No Action alternative may change the social system for mining, local employment, and county amenities. However, that alternative would probably have little effect on the overall system because mining will be sustained or increase at other adjacent and nearby properties in this portion of TBNG. If selecting the No Action alternative for future mining projects was to become a trend, then more serious negative cumulative effects would be likely.

Based on the individual resource cumulative effects above, the No Action alternative (Alternative 1) has the fewest cumulative impacts. However, that alternative will have the greatest effect on social and economic resources. The Proposed Action (Alternative 2) would have the most positive cumulative effect on social and economic aspects due to the sustained or potentially increased availability of job opportunities, added monetary benefits, and possible county and local community improvements.

### **Determination of Effects and Rationale**

The No Action alternative will have **no impact** on management in the project area, but **will impact** social and economic resources in the region.

The Proposed Action will have **no impact** on current local homeowners or renters. It will **benefit** the local economy by contributing to ongoing operations that will extend the life of the mine. The Proposed Action also will have a **positive impact** on local social systems by helping to maintain current programs and facilities.

### **Short-Term Use/Long-Term Productivity, Unavoidable Adverse Impacts, Irreversible or Irretrievable Commitments of Resources for Cultural Resources**

No loss in long-term productivity is expected under either alternative.

No unavoidable adverse effects are expected under either alternative.

The character of the area will not be changed by either alternative. Therefore, no irreversible or irretrievable impacts on economic and social conditions will occur under either alternative.

## **CHAPTER 4. CONSULTATION AND COORDINATION**

The USFS consulted with the following individuals, organizations, and federal, state, and local agencies during the development of this EIS:

### **Consultation and Coordination**

#### **Federal, State, and Local Agencies**

Bureau of Land Management (Casper and Buffalo Field Offices)  
Campbell County Commissioners  
Cheyenne and Arapaho Tribes of Oklahoma  
Cheyenne River Sioux Tribe  
Crow Creek Sioux Tribe  
Crow Tribal Council  
Department of Agriculture-Natural Resources Division  
Eastern Shoshone Tribe  
Environmental Protection Agency  
Lower Brule Sioux Tribe  
Northern Arapaho Tribe  
Northern Cheyenne Tribe  
Office of State Lands and Investments-Forestry Division  
Oglala Sioux Tribe  
Rosebud Sioux Tribe  
Standing Rock Sioux Tribe  
State Engineer's Office  
Three Affiliated Tribes  
US Fish and Wildlife Services-Buffalo Field Office  
US Fish and Wildlife Service-Ecological Services Office  
U.S. Representative Barbara Cubin  
U.S. Senator John Barrasso  
U.S. Senator Michael Enzi  
Water Development Commission  
Wyoming Business Council  
Wyoming Department of Environmental Quality-Air Quality Division  
Wyoming Department of Environmental Quality-Land Quality Division  
Wyoming Department of Environmental Quality-Water Quality Division  
Wyoming Department of Revenue-Ad Valorem Tax  
Wyoming Department of State Parks and Cultural Resources Historic Sites Division  
Wyoming Game and Fish Department  
Wyoming Livestock Board  
Wyoming State Forestry  
Wyoming State Historic Preservation Office  
Wyoming State Planning Office  
Wyoming State Trails Program

**Individuals and Organizations**

Big Horn Audubon Society  
Biodiversity Conservaton Alliance  
CBMCC  
Dilts, Jerry  
Funk, Wendell  
Land and Water Fund of the Rockies  
Litton, Patricia  
National Wildlife Federation  
Oil and Gas Conservation Commission  
Pellatz, Donald  
Powder River Basin Resource Council  
Sierra Club Northern Plains  
SINAPU  
Stoddard, Robert  
Stuart, James  
Thunder Basin Grazing Association  
Thunder Basin Resource Coalition  
Tracy, Dan  
Wind River Multi-Use Advocates  
Wyodak Resources Development Corporation  
Wyoming Outdoor Council  
Wyoming Professional Association of Archaeologists  
Wyoming Stockgrowers' Association  
Wyoming Travel and Tourism  
Wyoming Wildlife Federation

**List of Preparers**

Interdisciplinary Team Leader: Amy Ormseth

**Forest Service Specialists:**

Aquatics — Shawn Anderson  
Botany — Katherine Haynes  
Engineering — Anne Haverhals  
Fire/Fuels — Clay Westbrook  
Fluid Minerals — Amy Ormseth  
Heritage — Amanda Sanchez  
Hydrology — Carol Purchase  
Lands/Realty — Geri Proctor  
NEPA — Allen Hambrick  
Paleontology — Peter Rose  
Range — Moriah Shadwick  
Recreation — Marcia Rose-Ritchie  
Solid Minerals — Amy Ormseth

Social and Economics — Allen Hambrick  
Soils — Randy Tepler  
Visuals — Jeff Tupala  
Wildlife — Cristi Painter

**BKS Environmental Associates, Inc. Specialists (Vegetation, Soils):**

Katie Wilson, Dawn Gardner, Clay Wood

**GCM Services Specialist (Cultural):**

David Ferguson, Garren Meyer

**Knight Technologies, Inc. Specialist (Wetlands):**

Melody Smith

**McVehil-Monnett Associates, Inc. Specialists (Air Quality):**

Jim Easton, John Gilpin

**Thunderbird Wildlife Consulting, Inc. Specialist (Wildlife, 3<sup>rd</sup> Party Contractor):**

Gwyn McKee

## CHAPTER 5. LITERATURE CITED

- Avian Power Line Interaction Committee (APLIC). 2006. *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006*. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C. and Sacramento, CA. 207pp.
- Ayers, W.B., Jr. 1986. Lacustrine and Fluvial-Deltaic Depositional Systems, Fort Union Formation (Paleocene), Powder River Basin, Wyoming and Montana; AAPG, Vol. 70, No. 11, p. 1651-1673.
- Bendfeldt, E.S., J.A. Burger, and W.L. Daniels. 2001. Quality of Amended Mine Soils After Sixteen Years. *Soil Science Society of America Journal*, 65: 6: 1736-1744.
- BKS Environmental Associates, Inc. (BKS). 2005. PETS Plant surveys. Surveys conducted in summer 2005. Copy on file at BKS, Gillette, WY.
- \_\_\_\_\_. 2006. PETS Plant surveys. Surveys conducted in summer 2006. Copy on file at BKS, Gillette, WY.
- \_\_\_\_\_. 2007. PETS Plant surveys. Surveys conducted in summer 2007. Copy on file at BKS, Gillette, WY.
- \_\_\_\_\_. 2008. PETS Plant surveys. Surveys conducted in summer 2008. Copy on file at BKS, Gillette, WY.
- \_\_\_\_\_. 2010. PETS Plant surveys. Surveys conducted in summer 2010. Copy on file at BKS, Gillette, WY.
- Bureau of Land Management (BLM). 2010. Final Environmental Impact Statement for the Wright Area Coal Lease Applications. U.S. Department of Interior, BLM Casper Field Office, Casper, Wyoming.
- Campbell County Economic Development Corporation. 2008. Demographic Information. Available at: <http://www.gillettewyoming.net>. Accessed January 7, 2009.
- Cerovski, A.O., M. Grenier, B. Oakleaf, L. Van Fleet, and S. Patla. 2004. Atlas of Birds, Mammals, Amphibians, and Reptiles in Wyoming. Wyoming Game and Fish Department Nongame Program, Lander.
- Chumley, T.W., B.E. Nelson, and R.L. Hartman. 1998. Atlas of the Vascular Plants of Wyoming. University of Wyoming, Laramie, WY. Available at: <http://www.sbs.utexas.edu/tchumley/wyomap/atlas.htm>. Accessed May 5, 2008.

- Clark, T. W. and M. R. Stromberg. 1987. Mammals in Wyoming. Univ. of Kansas, Museum of Natural History, Lawrence, KS. 214pp.
- Denson, N.M., D. L. Macke, and R. R. Schumann. 1989. Geologic map and distribution of heavy minerals in Tertiary rocks of the Reno Junction 30' x 60' Quadrangle, Campbell and Weston Counties, Wyoming. U.S. Geological Survey, Miscellaneous Investigations Map I-2025.
- Dorn, R. D. 2001. Vascular Plants of Wyoming, third edition. Mountain West Publishing. Cheyenne, Wyoming.
- Fertig, W. 2001. State Species Abstract, Wyoming Natural Diversity Database- *Palafoxia rosea* var. *macrolepis*. WYNDD, Laramie, Wyoming.
- Fertig, W., R. Black, and P. Wolken. 2005. Rangewide Status Review of Ute Ladies'-Tresses (*Spiranthes diluvialis*). Prepared for the US Fish and Wildlife Service and Central Utah Water Conservancy District. Available at: [http://mountain-prairie.fws.gov/species/plants/uteladiestress/SPDI\\_Status%20review\\_Fertig2005.pdf](http://mountain-prairie.fws.gov/species/plants/uteladiestress/SPDI_Status%20review_Fertig2005.pdf). Accessed May 17, 2007.
- Fertig, W. and B. Heidel. 2007. *Spiranthes diluvialis*: Ute Ladies'-tresses. Wyoming Natural Diversity Database. Available at: [http://uwadmnweb.uwyo.edu/wyndd/Plants/state\\_spp\\_abstracts/S/Spiranthes\\_diluvialis\\_april12\\_2007.pdf](http://uwadmnweb.uwyo.edu/wyndd/Plants/state_spp_abstracts/S/Spiranthes_diluvialis_april12_2007.pdf). Accessed February 15, 2010.
- Grenier, Martin. 2003. An Evaluation of Black-footed Ferret Block Clearances in Wyoming: Completion Report. Wyoming Game and Fish Department. Lander, WY. 16pp.
- Heidel, B. 2001. Monitoring Ute ladies'-tresses (*Spiranthes diluvialis*), in Jefferson County, Montana, final report, 1996-2000. Report prepared for the Bureau of Land Management Montana State Office and Butte Field Office by the Montana Natural Heritage Program, Helena, MT.
- \_\_\_\_\_. 2007a. Survey of *Spiranthes diluvialis* (Ute ladies'-tresses) in eastern Wyoming, 2005-06. Prepared for Bureau of Land Management and the Medicine Bow/Routt National Forest/Thunder Basin National Grassland. Wyoming Natural Diversity Database, Laramie, WY.
- \_\_\_\_\_. 2007b. Wyoming Plant Species of Concern. Prepared by the Wyoming Natural Diversity Database, University of WY, Laramie, WY.
- Ingram, L.J, G.E. Schuman, P.D. Stahl, and L.K. Spackman. 2005. Microbial Respiration and Organic Carbon Indicate Nutrient Cycling Recovery in Reclaimed Soils. *Soil Science Society of America Journal*, 69: 6: 1737-1745.

- Kelly, B.T. 2009. Memo to Robert Sprentall regarding current list of threatened and endangered species by Brian T. Kelly Field Supervisor, Wyoming State Office USDI Fish and Wildlife Service, Cheyenne, WY. Copy on file at Medicine Bow-Routt NFs and Thunder Basin NG Supervisor's Office, Laramie, WY.
- Love, J.D., and A. C. Christiansen. 1985. Geologic Map of Wyoming, U.S. Geological Survey (3 sheets.)
- NatureServe. 2009. NatureServe Explorer: An online encyclopedia of life [web application]. Version 4.6. NatureServe, Arlington, VA. Available at: <http://www.natureserve.org/explorer>. Accessed February 15, 2010.
- Niering, W.A. 1985. Wetlands. Chanticlear Press, Inc., New York, New York. 638 pp.
- Pederson Planning Consultants. 2001. Appendix D in the Wyoming Energy Commission Preliminary Progress Report to the Wyoming Legislature. Joint Minerals, Business and Economic Development Committee. December 14, 2001. Draft Report commissioned by the Wyoming Energy Commission. 34 pp.
- Pocknall, D.T. 1987. Paleoenvironments and Age of the Wasatch Formation (Eocene), Powder River Basin, Wyoming; PALIOS, Vol. 2, No. 4, p. 368-376.
- Ritchie, I. and M. O'Rourke. 2009. Class I File Search for North Antelope Rochelle Mine and School Creek Mine 69 KV Power Line Relocation (Special Use Permits DGL217 and DGL153, USDA Forest Service). On file at Medicine Bow – Routt National Forests and Thunder Basin National Grassland Forest Douglas Ranger District Office, Douglas, WY.
- Roche, K. 2009. PETS-SLC Plant surveys. Surveys conducted in summer 2009. Copy on file at Medicine Bow – Routt NFs and Thunder Basin NG Supervisor's Office, Laramie, WY.
- Shukla, M.K., R. Lal, and M.H. Ebinger. 2005. Physical and Chemical Properties of a Minespoil Eight Years after Reclamation in Northeastern Ohio. *Soil Science Society of America Journal*, 69: 4: 1288-1297.
- Shukla, M.K., R. Lal, J. Underwood, and M. Ebinger. 2004. Physical and Hydrological Characteristics of Reclaimed Minespoils in Southeastern Ohio. *Soil Science Society of America Journal*, 68: 4: 1352-1359.
- Thompson, T.L. 2001. Improving compliance for TES species requirements. Memo of March 16, 2001. File Code 2670. On file at Medicine Bow – Routt National Forests and Thunder Basin National Grassland Forest Supervisor's Office, Laramie, WY.



- Unita Paleontological Associates, Inc. (Unita Paleo). 2008. An Assessment of Existing Paleontologic Data and Field Survey Results for the Proposed School Creek Mine in Campbell County, Wyoming. On file at Medicine Bow – Routt National Forests and Thunder Basin National Grassland Douglas Ranger District Office, Douglas, WY.
- U.S. Bureau of Labor Statistics. 2007. Local Area Unemployment Statistics, 1997–2006, Not Seasonally Adjusted. Available at: <http://data.bls.gov/>. Access date unknown.
- U.S. Census Bureau. 2001. Population and other demographics for various years. Available at: <http://www.census.gov/>. Accessed March 28, 2001.
- \_\_\_\_\_. 2006. Small Area Income and Poverty Estimates Program. Available at: <http://www.census.gov/did/www/saipe/index.html>. Access date unknown.
- U.S. Department of Agriculture (USDA). 1993. Soil Survey Manual. U.S. Dept. of Agric. Handbook 18, 437 pp. Government Printing Office.
- U.S. Department of Agriculture Forest Service (USFS). 1992. Forest Service Handbook 2509.18 - Soil Management Handbook
- \_\_\_\_\_. 2002. Thunder Basin National Grassland Land and Resource Management Plan. Rocky Mountain Region, Lakewood, CO. 2001 Revision.
- \_\_\_\_\_. 2003a. Regional Planning Desk Guide Chapter 27: Selection of Sensitive Species, Species of Local Concern, and MIS in R2. Rocky Mountain Region, Lakewood, CO. On file at Medicine Bow- Routt National Forests and Thunder Basin National Grassland Supervisor's Office, Laramie, WY.
- \_\_\_\_\_. 2003b. FSH 2509.18, Soil Management Handbook, Chapter 2 – Soil Quality Monitoring. January 21, 2003.
- \_\_\_\_\_. 2010. Index of Species Information- SPECIES: *Lewisia rediviva*. Available at: <http://www.fs.fed.us/database/feis/plants/forb/lewred/all.html>. Accessed May 19, 2010.
- \_\_\_\_\_. FSH 1909.12, Section 25.4. Land and Resource Management Planning Handbook. Available at: <http://www.fs.fed.us/im/directives/fsh/1909.12/>. Accessed August 14, 2010.
- \_\_\_\_\_. FSH 1909.15. National Environmental Policy Act Handbook. Effective Date: September 21, 1992. Available at: <http://www.fs.fed.us/im/directives/fsh/1909.15/>. Accessed June 4, 2010.
- \_\_\_\_\_. FSH 2209.13, Section 95. Grazing Permit Administration Handbook. Available at: <http://www.fs.fed.us/im/directives/fsh/2209.13/>. Accessed June 4, 2010.

- \_\_\_\_\_. FSH 2809.15. Minerals and Geology Handbook. Available at: <http://www.fs.fed.us/im/directives/fsh/2809.15/>. Accessed June 24, 2010.
- \_\_\_\_\_. FSH 2709.11. Special Uses Handbook. Available at: <http://www.fs.fed.us/im/directives/fsh/2709.11/>. Accessed June 24, 2010.
- \_\_\_\_\_. FSH 2509.25. Watershed Conservation Practices Handbook. Available at: [http://www.fs.fed.us/cgi-bin/Directives/get\\_dirs/fsh?2509.25](http://www.fs.fed.us/cgi-bin/Directives/get_dirs/fsh?2509.25). Accessed June 24, 2010.
- U.S. Department of Agriculture Natural Resource Conservation Service (NRCS). 2008a. Web Soil Survey. Available online at: <http://websoilsurvey.nrcs.usda.gov/app/> [Nov. 2011].
- \_\_\_\_\_. 2008b. Northern Converse County Soils. Available online at: <http://soildatamart.nrcs.usda.gov/> [Nov. 2011].
- \_\_\_\_\_. 2009. The PLANTS Database (<http://plants.usda.gov>, 4 December 2009). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.
- U.S. Department of Energy. 2008. Coal News and Markets, a report series on coal production and prices. Energy Information Administration. Available at: [www.eia.doe.gov/cneaf/coal/page/coalnews](http://www.eia.doe.gov/cneaf/coal/page/coalnews). Accessed November 17, 2008.
- \_\_\_\_\_. 2009. Coal. Available at: <http://www.energy.gov/energysources/coal.htm>. Accessed February 13, 2009.
- U.S. Department of Interior Fish and Wildlife Service (USFWS). June 1, 1995. Recommendations and Guidelines for Ute Ladies' Tresses Orchid (*Spiranthes diluvialis*) Recovery and Fulfilling Section 7 Consultation Responsibilities. 7 pp.
- \_\_\_\_\_. February 2, 2004. File letter ES-1411/BFF/WY7746 issuing block clearance for black-footed ferrets in all black-tailed prairie dog colonies throughout Wyoming, and select white-tailed prairie dog colonies. Wyoming Field Office of the U.S. Fish and Wildlife Service, Cheyenne.
- \_\_\_\_\_. 2009. Federal Endangered, Threatened, Proposed, and Candidate Species that Occur in or May be Affected by Projects in Campbell County, Wyoming. Last Updated March 2009. Available at: <http://www.fws.gov/wyominges/PDFs/CountySpeciesLists/Campbell-sp.pdf>. Accessed March 7, 2009.
- \_\_\_\_\_. 2010. Federal Endangered, Threatened, Proposed, and Candidate Species that Occur in or May be Affected by Projects in Campbell County, Wyoming. Last Updated July 2010. Available at: <http://www.fws.gov/wyominges/PDFs/CountySpeciesLists/Campbell-sp.pdf>. Accessed July 15, 2010.

- Westerman, James W. 1991. Soil Survey of Campbell County, Wyoming Southern Part. U.S. Department of Agriculture, Soil Conservation Service. U.S. Government Printing Office, Washington, D.C.
- Wyoming Community Development Authority. 2008. The 2008 Wyoming Housing Needs Forecast. Available at: [http://www.wyomingcda.com/FRCST\\_2008\\_Final.pdf](http://www.wyomingcda.com/FRCST_2008_Final.pdf). Accessed November 2008.
- Wyoming Department of Environmental Quality - Land Quality Division. 1996. Guideline 1 - Topsoil and Overburden. Wyoming Department of Environmental Quality – Land Quality Division, Cheyenne, Wyoming.
- Wyoming Mining Association. 2009. Wyoming Coal. Available at: <http://www.wma-minelife.com/coal/coalhome.html>. Accessed May 2009.
- Zipper, C.E., J.A. Burger, J.M. McGrath, J.A. Rodrique, and G.I. Holtzman. 2011. Forest Restoration Potentials of Coal-Mined Lands in the Eastern United States. *Journal of Environmental Quality*, 40: 5: 1567-1577.

**APPENDIX 1**  
**TBNG LAND AND RESOURCE MANAGEMENT PLAN**  
**GOALS AND OBJECTIVES, STANDARDS, AND**  
**GUIDELINES APPLICABLE TO THE MACKEY ROAD**  
**RELOCATION PROJECT**

## **APPLICABLE GRASSLAND PLAN STANDARDS AND GUIDELINES**

### **Goal 1: Ensure Sustainable Ecosystems**

**Goal 1.b:** Provide ecological conditions to sustain viable populations of native and desired non-native species and to achieve objectives for Management Indicator Species (MIS).

**Objectives:**

2. Within 15 years, demonstrate positive trends in population viability, habitat availability, habitat quality, population distribution throughout the species range within the planning area, and other factors affecting threatened, endangered, sensitive species and MIS.
9. Conduct target surveys for globally rare plant species (Barr's milkvetch, smooth goosefoot, Ute ladies' tresses) and other rare plant species with viability concerns.

### **Goal 2: Multiple Benefits to People**

**Goal 2.c:** Improve the capability of the Nation's forests and grasslands to provide a desired sustainable level of uses, values, products, and services.

#### **Mineral and Energy Resources**

**Objective:**

2. Honor all valid existing legal mineral rights.

#### **Scenery**

**Objective:**

1. Implement practices that will meet, or move the landscape character toward scenic integrity objectives. Reference Geographic Area direction.

#### **Special Uses**

**Objective:**

1. Ensure all special use permits are meeting requirements for customer service and are in compliance with the terms of their permits or contracts.

### **Goal 4: Effective Public Service**

**Goal 4.a:** Improve the safety and economy of the USDA Forest Service roads, trails, facilities, and operations and provide greater security for the public and employees.

**Objective:**

1. Within 5 years, identify travel opportunities and restrictions, including designating motorized travel-ways and areas, to meet land management objectives. Provide reasonable access for use of national grasslands and national forests.

## Physical Resources

### A. Air

1. Conduct all land management activities in such a manner as to comply with all applicable federal, state, and local air-quality standards and regulations including: Federal Clean Air Act, as amended, 1990 (42 USC 7401-7671); North Dakota Air Pollution Control Law, (33-15-02); and South Dakota Air Pollution Control Program (Title 74, #36). **Standard**
2. Meet requirements of the Prevention of Significant Deterioration (PSD), State Implementation Plans (SIP), and applicable Smoke Management Plans. **Standard**
3. Ensure emissions from projects on the Grassland and forest management activities are within Class I or Class II ranges. (See USFS Appendix A regarding Class I Areas.) **Standard**

(See Geology and Minerals; Leaseable Minerals section to find air standards and guidelines related to mineral operations.)

### B. Water

4. Design and construct all stream crossings and other instream structures to provide for passage of flow and sediment, withstand expected flood flows, and allow free movement of resident aquatic life. **Standard**
9. Construct roads and other disturbed sites to minimize sediment discharge into streams, lakes, and wetlands. **Standard**
14. Locate activities and facilities away from the water's edge or outside the riparian areas, woody draws, wetlands, and floodplains unless alternatives have been assessed and determined to be more environmentally damaging. If necessary to locate activities or facilities in these areas, then:
  - Deposit no waste material (silt, sand, gravel, soil, slash, debris, chemical, or other material) below high water lines, in riparian areas, in the areas immediately adjacent to riparian areas or in natural drainage ways (draws, land surface depressions or other areas where overland flow concentrates and flows directly into streams or lakes).
  - Prohibit deposition of soil material in natural drainage ways.
  - Locate the lower edge of disturbed or deposited soil banks outside the active floodplain.
  - Prohibit stockpiling of topsoil or any other disturbed soil in the active floodplain.
  - Locate drilling mud pits outside riparian areas, wetlands and floodplains. If location is unavoidable in these areas, seal and dike all pits to prevent leakage.

- Rehabilitate gravel pits, if located in riparian zones, to simulate a natural riparian/aquatic situation. **Guideline**
15. Do not allow new roads to parallel streams when road location must occur in riparian areas unless alternatives have been assessed and determined to be more environmentally damaging. Cross streams at right angles. Locate crossings at points of low bank slope and firm surfaces. **Standard**

(See the Water Conservation Practices Handbook, Forest Service Handbook [FSH] 2509.25, TBNG LRMP for further information.)

### **C. Soils**

1. Limit roads and other disturbed sites to the minimum feasible number, width, and total length consistent with the purpose of specific operations, local topography, and climate. **Standard**
2. Stabilize and maintain roads and other disturbed sites during and after construction to control erosion. **Standard**
3. Reclaim roads and other disturbed sites when use ends, as needed, to prevent resource damage. **Standard**
4. Prohibit soil-disturbing activities (e.g., road construction, well pad construction) on slopes greater than 40 percent and on soils susceptible to mass failure. **Guideline**

(See the FSH 2509.18 Soil Management Handbook R2 Supplement No. 2509.18-92-1 for further information.)

### **D. Minerals and Energy Resources**

#### **Geophysical Operations**

4. Where no suitable mitigation measures are possible, prohibit geophysical (seismic) operations that cause surface disturbance in Research Natural Areas, Special Interest Areas, American Indian traditional use area, and known National Register eligible sites. **Standard**

#### **Energy and Mineral-Related Special Uses**

14. Minimize disturbance by co-locating roads, pipelines, gathering lines, and power lines for energy resource development. **Guideline**

### **E. Paleontological Resources**

1. Protect key paleontological resources (Classes 3, 4, and 5 of the Fossil Potential Classification) from disturbance, or mitigate the effects of disturbance, to conserve scientific, interpretive, and legacy values (see Paleontological Appendix J for details [refers to appendix in USDA Forest Service 2002]). **Standard**

3. Prior to ground-disturbing activities, conduct paleontological surveys in any area where there is a high potential to encounter these resources according to the process outlined in Appendix J [refers to appendix in USDA Forest Service 2002]. **Standard**

## **Biological Resources**

### **F. Fish, Wildlife, and Rare Plants**

#### **Mountain Plover**

25. To help maintain suitable nesting habitat for mountain plover, prohibit development of new facilities within 0.25 miles of known mountain plover nests or nesting areas. This does not apply to pipelines, fences and underground utilities. **Standard**
28. To help reduce disturbances and risks to nesting mountain plover, prohibit the following activities in plover nesting areas or within 0.25 mile of plover nests from March 15 through July 31:
- Construction (e.g., roads, water impoundments, oil and gas facilities),
  - Reclamation,
  - Seismic exploration,
  - Gravel mining operations,
  - Oil and Gas drilling,
  - Drilling of waterwells,
  - Prescribed burning. **Standard**
29. To help reduce disturbances and risks to nesting mountain plover, do not authorize the following activities in plover nesting areas or within 0.25 mile of plover nests from March 15 through July 31:
- Construction (e.g., pipelines, utilities, fencing),
  - Workover operations for maintenance of oil and gas wells,
  - Permitted recreation events involving large groups of people,
  - Grasshopper spraying,
  - Prairie dog shooting (in consultation with state wildlife agencies and U.S. Fish and Wildlife Service). **Guideline**
31. To help reduce risks to mountain plovers from traffic, limit vehicle speeds in occupied mountain plover habitat to 25 mph on resource roads and 35 mph on local roads. **Standard**

#### **Sensitive Plant and Animal Species**

35. Do not authorize new facilities, roads, trails, fences, salting and mineral areas, water developments in habitat occupied by sensitive plant species. **Guideline**



37. Identify sensitive plant habitats and rare plant communities as priorities for invasive plant monitoring and control. **Guideline**
38. Avoid the use of invasive plant control methods that may negatively impact sensitive plants. **Guideline**

**Sage Grouse**

47. To help reduce disturbances to nesting sage grouse, prohibit the following activities within 2.0 miles of active display grounds from March 1 to June 15:  
Construction (e.g., roads, water impoundments, oil and gas facilities),  
Reclamation,  
Gravel mining operations,  
Drilling of water wells,  
Oil and gas drilling,  
Training of hunting dogs. **Standard**
48. To reduce disturbances to nesting sage grouse, do not authorize the following activities within 2.0 miles of active display grounds from March 1 to June 15:  
Construction (e.g., pipelines, utilities, fencing),  
Seismic exploration,  
Workover operations for maintenance of oil and gas wells,  
Permitted recreation events involving large groups of people. **Guideline**
49. To help prevent reproductive failure, limit noise on sage grouse display grounds from nearby facilities and activities to 49 decibels (10 dBA above background noise) from March 1 to June 15. **Guideline**
51. When constructing facilities or structures within 2 miles of a sage grouse active display ground, design them to discourage raptor perching by maintaining a low profile or using perch inhibitors. **Guideline**
52. Prohibit development or operations of facilities within 2 miles of a sage grouse display ground if these activities would exceed a noise level of more than 10 decibels above the background noise level (39 db), at 800 feet from the noise source, from March 1 to June 15. **Guideline**

**Burrowing Owls**

65. To optimize habitat for burrowing owls, manage for active prairie dog colonies that are larger than 80 acres. **Guideline**

### **Black-tailed Prairie Dog**

69. To reduce risks and habitat loss for prairie dogs and other wildlife species closely associated with prairie dog colonies, align new roads outside prairie dog colonies. If it's necessary to place a new road in a prairie dog colony, minimize the amount of road within the colony to the extent that soil, drainage, topographical and other physical factors will allow. **Guideline**

### **Swift Fox**

70. To reduce disturbances to swift fox during the breeding and whelping seasons, prohibit the following activities within 0.25 miles of their dens from March 1 to August 31:
- Construction (e.g., roads, water impoundments, oil and gas facilities),
  - Reclamation,
  - Gravel mining operations,
  - Drilling of water wells,
  - Oil and gas drilling. **Standard**
71. To reduce disturbances to swift fox during the breeding and whelping seasons, do not authorize the following activities within 0.25 miles of their dens from March 1 to August 31:
- Construction (e.g., pipelines, utilities, fencing)
  - Seismic exploration,
  - Workover operation for maintenance of oil and gas wells,
  - Permitted recreation events involving large groups of people. **Guideline**

### **Raptors**

76. To help prevent abandonment, reproductive failure or nest destruction, prohibit development of new facilities within the minimum distances (line of sight) of active raptor nests and winter roost sites as specified in the following table. For the bald eagle, golden eagle, merlin, ferruginous hawk and Swainson's hawk, a nest is no longer considered active if it is known to have been unoccupied for the last 7 years. For the burrowing owl and other raptor species, a nest is no longer considered active if it is known to have been unoccupied during the current or most recent nesting season. This does not apply to pipelines, fences and underground utilities. **Standard**

Species and Habitat	Minimum Distance (miles)
Bald Eagle Nest	1.0
Bald Eagle Winter Roost Area	1.0
Golden Eagle Nest	0.25
Merlin Nest	0.25
Ferruginous Hawk Nest	0.25
Swainson's Hawk Nest	0.25
Burrowing Owl Nest	0.25
Nests of Other Raptors	0.125

Note: This table is from Chapter 1: Grassland-wide Direction of the Thunder Basin National Grassland Forest Plan (2002).

77. To help reduce disturbances to nesting and wintering raptors, prohibit the following activities within the minimum distances (line of sight) of active raptor nests and winter roost areas during the dates specified in the table below:

Construction (e.g., roads, water impoundments, oil and gas facilities),

Reclamation,

Gravel mining operations,

Drilling of water wells,

Oil and gas drilling,

Timber harvest and fuel treatments,

Precommercial thinning. **Standard**

Species and Habitat	Minimum Distance (miles) and Dates
Bald Eagle Nest	1.0 from 2/1 to 7/31
Bald Eagle Winter Roost Area	1.0 from 11/1 to 3/31
Golden Eagle Nest	0.50 from 2/1 to 7/31
Merlin Nest	0.50 from 4/1 to 8/15
Ferruginous Hawk Nest	0.50 from 3/1 to 7/31
Swainson's Hawk Nest	0.50 from 3/1 to 7/31
Burrowing Owl Nest	0.25 from 4/15 to 8/31
Nests of Other Raptors	0.125 from 2/1 to 7/31 <sup>a</sup>

<sup>a</sup> Dates may vary depending on the species.

Note: This table is from Chapter 1: Grassland-wide Direction of the Thunder Basin National Grassland Forest Plan (2002).

78. To help reduce disturbances to nesting and wintering raptors, do not authorize the following activities within the minimum distances (line of sight) of active raptor nests and winter roost areas during the dates specified in the previous table:

Construction (e.g., pipelines, utilities, fencing),

Seismic exploration,

Workover operations for maintenance of oil and gas wells,

Fuelwood cutting,

Permitted recreation events involving large groups of people. **Guideline**

79. If a winter roost area or nest site is discovered, ensure that the necessary habitat components are maintained, including maintenance and regeneration of woodlands.

**Standard**

### **J. Noxious Weeds, Non-native, and Invasive Species**

2. To prevent the spread of undesirable non-native and invasive plant species, include necessary provisions in contracts and permits for use of the National Grasslands and its resources. **Standard**

5. Allow only certified noxious weed seed-free products for animal feed or re-vegetation projects. This includes use of certified hay or straw, and heat-treated, or other appropriately processed products. **Standard**

7. Where technically and economically feasible, use genetically local (at the ecological subsection level) native plant species in re-vegetation efforts. To prevent soil erosion, non-native annuals or sterile perennial species may be used while native perennials are becoming established. **Guideline**

## **Administration**

### **N. Heritage Resources**

7. Limit non-research oriented ground-disturbing activities on heritage districts and sites eligible for the National Register Historic Preservation (NRHP) that creates adverse impacts to the district or site. **Guideline**

### **P. Special Uses**

6. Route new roads, pipelines, gathering lines, and technically required overhead power lines in a manner as to minimize visual impacts and conform to approved corridors. When these facilities leave corridors, they should be subordinate to the landscape (see Scenic Integrity in Glossary [refers to glossary in USDA Forest Service 2002]). **Guideline**
9. Don't approve land-use authorizations identified for disposal if that occupancy will affect disposal action. **Standard**
10. Act on special-use applications according to the following priorities:

Land and land-use activity requests relating to public safety, health and welfare, e.g., highways, power lines and public service improvements.

Land and land-use activities contributing to increased economic activity associated with Grassland National Forest System resources, e.g., oil and gas and energy minerals.

Land and land-use activities that benefit only private users, e.g., road permits, rights-of-way for power lines, telephones, waterlines, etc. **Guideline**

13. Don't approve any special-use applications that can reasonably be met on private or other federal lands unless it is clearly in the public interest. **Guideline**

**Q. Infrastructure Use and Management**

4. Perform site-specific Roads Analysis, including public involvement, prior to making any decisions on road construction, reconstruction, and decommissioning. **Guideline**
5. Do not invest in new facilities on lands meeting the criteria for disposal. **Guideline**
6. Build new and reconstructed fences to provide for access for other uses such as big game movement, recreation, fire protection, and mineral development. **Guideline**

## **APPENDIX 2 PUBLIC SCOPING COMMENTS**

### **Mackey Road Relocation Project**

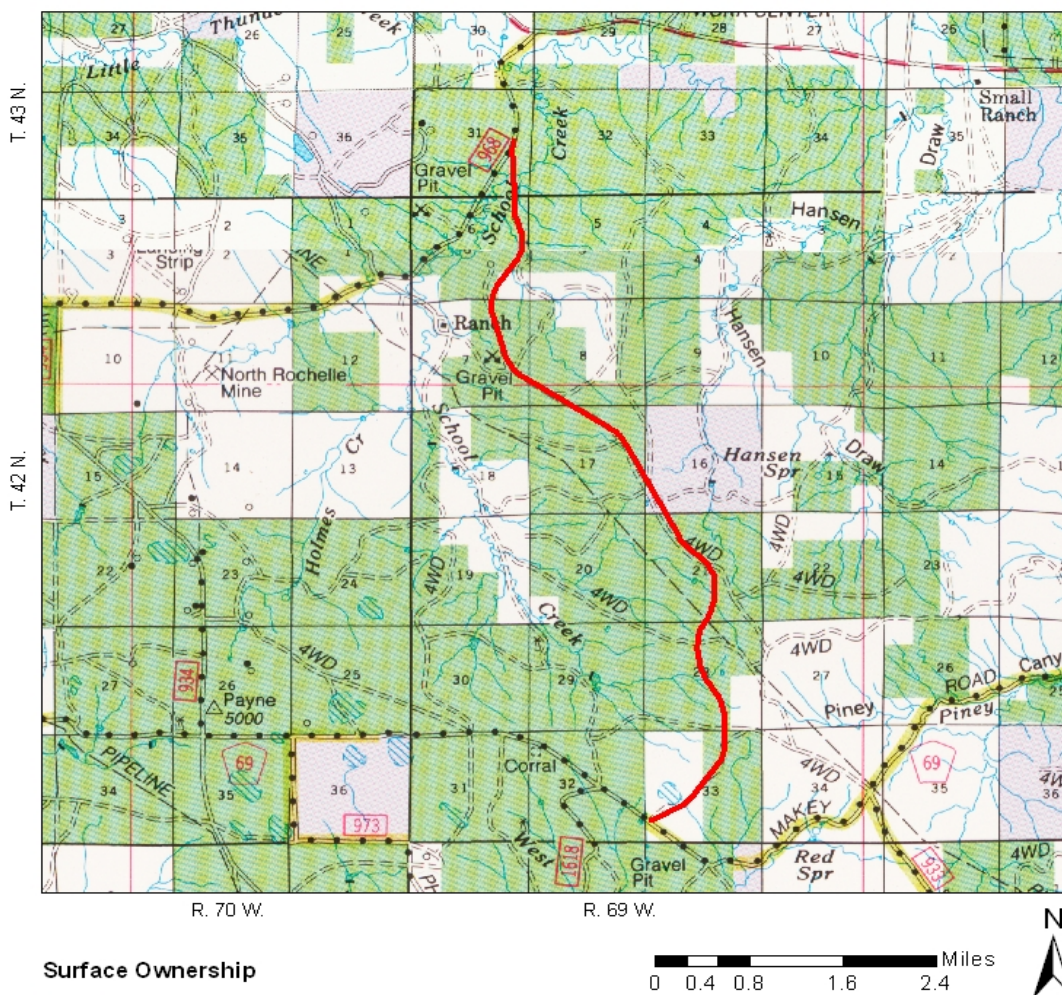
The Thunder Basin National Grassland received input to public scoping for the Mackey Road Relocation project from two individuals, groups, or governmental agencies. These letters, emails and notes are located in the project file.

1. Northern Cheyenne Tribe: No concerns expressed
2. Wyoming Game and Fish Department: Numerous wildlife-related concerns expressed

Public comments will be solicited for this DEIS upon its release. All comments and USFS responses will be reflected in the FEIS for this project.

## APPENDIX 3 - MAPS

**Exhibit A: Mackey Road Reconstruction Route**  
T. 42 N., R. 69 W. and T. 43 N., R. 69 W., 6th P.M., Campbell County



### Surface Ownership

- National Forest System
- Private
- State



Map created 10/24/11  
updated 05/01/13

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